Knowledge to Action: Investigating Teachers' Knowledge, Use and Implementation of Autism Evidence-based Practices in Saudi Arabia

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Statement of Originality

This statement is written to declare that all content of this thesis is solely my own work and has not been submitted for any other degree or previously published. I also confirm that the contributions of others, including editing and formatting of my thesis, are explicitly acknowledged. This thesis also adhered to the University of Sydney's Human Research Ethics Committee (HREC) requirements for the conduct of research.

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Signature: 

Abstract

The increasing number of children diagnosed with autism entering mainstream education has placed significant pressure on schools to optimise students' academic and developmental growth. As a result, a wide array of interventions recognised as Evidence-Based Practices (EBPs) has been developed for use by teachers of students with autism. The implementation of EBPs in autism classrooms has proven to be a cornerstone of effective teaching performance in improving students' outcomes. However, several concerns have been raised in the literature in relation to autism teachers' use of scientifically unsupported practices and their reliance on personal experience. This has prompted calls for research aimed at bridging the research-to-practice gap to embrace a paradigm shift that emphasises active implementation processes.

A mixed-methods approach was employed in this study. Purposive sampling was used to recruit teachers in public and private schools in Saudi Arabia who met the inclusion criteria. Guided conceptually by the knowledge-to-action framework, a quantitative, self-report survey was employed to examine participants' knowledge and use of various teaching practices. A qualitative research design, based on focus group discussions, was used to investigate the barriers to and facilitators of the implementation of EBPs as perceived by teachers of students with autism.

Analysis of the quantitative data from the survey of 106 participants indicated greater knowledge and use of EBPs compared to emerging (EM) and unsupported teaching practices (UN). Although there were significant differences in knowledge and use of EBPs compared to other teaching practice categories, findings also indicated that teachers of students with autism in Saudi Arabia continue to implement teaching practices that have insufficient empirical evidence or have proven to be ineffective or harmful. Comparison by gender, years of experience, and employment sector on reported knowledge and use of EBPs, EM and UN teaching practices indicated no statistically significant demographic differences, with only a few exceptions.

Reflexive thematic analysis of the qualitative data identified various barriers to the implementation of EBPs. These were categorised into four themes: (1) The university failed to prepare me; (2) Failure to thrive in an ill-equipped classroom; (3) Insufficient EBP knowledge; (4) Administrative and structural obstacles. Three main themes emerged in relation to

facilitators: (1) Customising EBP training; (2) Building teams and enhancing collaboration; and (3) Making EBP contextually relevant.

The main limitations of the study related to scope, sampling technique and sample size, as well as time and resource constraints. Nonetheless, the findings provide baseline evidence that can guide future research and inform the development of relevant policies and programs by the Ministry of Education that enhance the implementation of evidence-based autism practices and facilitate teachers' involvement in the translation process. The study aligns with the call for a paradigm shift away from a focus on the efficacy of EBPs towards an exploration of the factors that contribute to successful implementation and sustainment. The findings also represent an original contribution to the literature on ensuring the contextual relevance of implementation strategies in different cultural settings.

Acknowledgement and Dedication

Above all, I thank God for guiding me to select the path of study and research, for answering my prayer when I begged “pour upon me patience and plant firmly my feet” to continue this journey.

I would like to express my gratitude to my supervisors, Dr Jessica Zanuttini and Dr Cathy Little, for their generous support, time, and inspiration, which made this mission possible. Their support was not only to guide my research processes and verify academic decisions but to encourage me to maintain my mental health and always take care of my family. I also thank Dr Cherry Russell for her support in providing copyediting services and ensuring correct thesis formatting according to the guidelines for editing research theses.

This thesis is my original work, and the University of Sydney’s Guidelines on the Attribution of Generative AI Use for Research Students were adhered to. I acknowledge that the AI tools used in this thesis include ChatGPT, which was used for minor copyediting and to check the choice of transition words and phrases. The Grammarly platform was also used for proofreading. Additionally, Manus AI was employed to facilitate the search and verification of accurate DOI numbers for the references.

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This research thesis is dedicated to my lovely wife, Khawlah, who has shared with me various difficulties during this journey, living abroad and enduring the pain of loneliness for many years while proudly taking care of our three beautiful children, Sami, Khallad, and my little princess Eshraga.

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Chapter 1: Introduction and Background

The Convention on the Rights of Persons with Disabilities (CRPD) is a legally binding instrument that has been adopted internationally to protect the rights of individuals with disabilities, including their right to inclusion and equal opportunities (United Nations, 2006). According to Article 1of the CRPD, "persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (p. 4). This includes individuals diagnosed with autism.

Since ratifying the CRPD, Saudi Arabia has enacted several pieces of legislation to enhance service provision for individuals with special needs (Alsalem, 2023). Some of these were inspired by United States regulations for students with special needs, such as the Individuals with Disabilities Education Act (IDEA, 1997). For instance, Saudi Arabia established its first special education legislation guidelines in 2001, the Regulations of Special Education Programs and Institutes (RSEPI) (Alquraini, 2013).

Recently, the King of Saudi Arabia issued a Royal Decree updating this legislation. Known as the *System of Rights of Persons with Disabilities*, it was approved by a cabinet resolution in 2023. These legislative updates relate to enhancing equality, inclusiveness, employment, educational and health accessibility and enforcing criminal penalties for any act of discrimination against individuals with special needs (Bureau of Experts at the Council of Ministers, 2023).

In the context of school education, the United States of America introduced the IDEA and the No Child Left Behind Act (NCLB) to enhance school educational practices (Yell, 2012). For example, the IDEA legislation specifies that teachers working in special education classrooms must hold at least a bachelor's degree and be certified in special education teaching, as well as demonstrate competencies in subject matter (Alquraini, 2013). Moreover,

teaching practices must be based on scientifically validated research. To this end, the NCLB of 2001 contains over 110 citations to scholarly studies that support and guide the utilisation of such practices. These are widely referred to as evidence-based practice (EBP) and are defined as specialised approaches or interventions that use advanced research methods to acquire information about best practices.

The concept has been applied in a range of disciplines, where it is associated with terms such as “empirical, science-based, evidence, practice guidelines, systematic reviews [and] meta-analyses”, among others (Thyer, 2004, p. 167). In special education and autism research, other terms, such as best practices, empirically supported strategies, scientifically based research, and systematically validated approaches, have been employed (Mesibov & Shea, 2011). However, recent literature reviews suggest that special education researchers prefer EBP (Hume et al., 2021; Leaf et al., 2021; Wong et al., 2014). In autism research, EBP is defined as teaching practices (single-session or package interventions) that have been proven by high-quality scientific research and meet inclusion criteria as determined by reviewers to be effective in enhancing outcomes of students with autism (Steinbrenner et al., 2020). In the context of Saudi Arabia, the RSEPI highlights the importance of utilising EBPs to inform decision-making in relation to teaching students with special needs (Alquraini, 2013).

Although autism was first described by Kanner in 1943, its nature and symptoms were poorly understood over the ensuing decades. Thus, knowledge about how to educate students with autism was minimal. Autism was only formally recognised as a separate diagnostic category in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980 (American Psychiatric Association [APA], 1980). Before 1980, lack of knowledge about the disorder meant that it was common for children with challenging behaviours, including those with autism, to be rejected by the public school system, and parents were advised to

institutionalise their children (Reichow et al., 2011). However, several highly motivated parents created a curriculum to help their children improve their academic and behavioural skills; these pioneering programmes were the first attempts to respond to the challenging behaviours associated with autism. Subsequent behavioural science research, such as the work of Lovaas and the TEACCH educational programme, made significant contributions to the education of children with autism (Lovaas, 1971; Mesibov & Shea, 2011). Similarly, Odom et al. (2021) argue that several teaching practices for students with autism can be attributed to Lovaas and the TEACCH educational programme

Understandings of the nature of autism, its diagnostic criteria and intervention options have undergone significant transformation since it was first described by Kanner (Happé & Frith, 2020). Autism is now understood as a neurodevelopmental, heterogeneous, lifelong condition (Conti et al., 2022; Happé & Frith, 2020; Hobson & Petty, 2021; Zheng et al., 2020) that is characterised by two main impairments: a persistent deficit in social communication and interaction, and restricted and repetitive behaviours and interests (American Psychiatric Association, 2013).

In the early 2000s, various scholars argued that no single intervention or programme worked equally well for all children and that teaching practices must be refined to meet the diverse needs of affected children (Lord et al., 2005; Simpson, 2005; Smith et al., 2007). At the same time, it was noted that many teaching practices were categorised as EBPs although the research on which they were based did not adhere to the methodological guidelines for a scientific systematic review (Lord et al., 2005). In response, a growing number of studies adopted systematic approaches and employed well-defined inclusion criteria in EBP research. These criteria have been used to develop and disseminate user-friendly EBP guidelines for teaching various age groups of students with autism (e.g., National Autism Center [NAC],

2009; National Autism Center [NAC], 2015; Odom et al., 2003; Odom et al., 2010; Roberts et al., 2016; Steinbrenner et al., 2020; Wong et al., 2014).

It is especially important to note that the dissemination of such guidelines of EBPs does not guarantee that teachers will adopt and implement them into their routine practice. Although recent research indicates that enhanced student outcomes are contingent on teachers' implementation of EBP (Harbin et al., 2024; Steinbrenner et al., 2020; Watkins et al., 2019), a significant gap remains between research and practice in many countries, including Saudi Arabia (Alatifi et al., 2023; Boyd et al., 2022; Brock et al., 2020; Harbin et al., 2024; Kelly et al., 2024). Various research studies indicate that teachers rely on unreliable sources (Dingfelder & Mandell, 2011), utilise unsupported (Alatifi et al., 2023; Barry et al., 2021; Paynter et al., 2017), or even harmful teaching practices (Knight et al., 2019). Domitrovich et al. (2008) argue that, while schools in general act in good faith and have a desire to adopt high-quality educational practices, their understanding of the factors that support successful implementation is limited.

The underuse of EBPs and the persistent gap between research knowledge and real-world practice is considered one of the most important issues in autism education (Cook & Odom, 2013; Guldberg, 2017; Knight et al., 2019; Odom et al., 2020). Guldberg (2017) has argued that this gap will only be reduced through a paradigm shift in autism-related educational research; specifically, by "recognising that evidence applicable to education will occur in diverse forms and therefore needs to be gathered through diverse means" (p. 150). This will involve shifting the focus from utilising only the dominant experimental designs to employing a wider variety of methodologies. Additionally, embracing the participation of stakeholders, including teachers of students with autism to promote alignment between research and practice. Luskin-Saxby and Paynter (2018) support the need for deploying a

better balance of methodologies and working in partnership with practitioners and teachers of students with autism in order to enhance the integration of research knowledge into practice. According to Odom et al. (2020), knowing what works is not enough for successful adoption and implementation, and researchers must address the complexity involved in doing this. They cite previous research indicating a gap of approximately 17 years between the production of research knowledge and its actual integration into practice routines. In other words, the dissemination of research evidence is not sufficient as an aim of implementation science (IS), as this alone does not lead to successful knowledge integration (Boyd et al., 2022).

Translating knowledge of EBP in autism education into routine practice continues to present a challenge. A scoping review by Lee et al. (2025) found that, while there has been a new research orientation toward employing and benefiting from implementation science in autism education, especially in school settings, the full potential of IS in the autism field remains unexplored. The authors assert that there is a pressing need for future implementation research to give priority to school communities that specifically serve students with autism with minority backgrounds. The aims of the present study align with this shift toward employing IS frameworks and methods to enhance EBP implementation in autism educational settings. It is also motivated by the challenge proposed by Boyd et al. (2022) for autism researchers to meaningfully participate in the translation of knowledge into practice. Accordingly, the broad aim of the present study was to gain baseline evidence of current practices in educational settings in Saudi Arabia and to explore key contextual barriers and facilitators that influence the implementation of EBPs.

This chapter introduces the study, provides contextual information about Saudi Arabia, states the research questions, and presents a brief overview of the theoretical framework, research methods, aim, and significance of the study. The following section

describes the geographical, sociocultural, and religious context of Saudi Arabia. It outlines the development of its educational system, including the provision of education for students with special needs, such as those with autism. The section also identifies current challenges and considers how autism education and research might benefit from Saudi Arabia's Vision 2030 policy.

1.1 The Study Setting: Saudi Arabia

Saudi Arabia is an independent Arab Islamic state located southwest of Asia. It is bordered by other Arab countries, including the United Arab Emirates, Qatar, Kuwait, Jordan and Yemen. It occupies the largest land area in the Middle East, accounting for four-fifths of the Arabian Peninsula and covering more than 2,250,000 square kilometres. Saudi Arabia is also one of the most densely populated nations, recently exceeding 35 million (Saudi General Authority of Statistics, 2024). Interestingly, Saudi Arabia's population is very young. Statistics indicate that 70% of the population is represented by those 30 years old and younger, whereas approximately 5% of the population is older than 60 years (Basheikh et al., 2021). Numerous economic benefits have been associated with having a young population. However, many challenges and pressures are also placed on the government to provide appropriate educational and employment opportunities.

Saudi Arabia is a highly homogeneous and religiously and socially conservative society with strong foundations in tribalism and Islam, all of which contribute to its complex and unique culture (Alnahdi et al., 2019). Islam is the primary religion, and its teachings are reflected not only in practices of worship but also in social interactions, education and even financial dealings. As the birthplace of Islam, it remains a destination for Muslims travelling to the Grand Mosque of Mecca and performing the rituals of Hajj.

The modern Kingdom of Saudi Arabia was established on September 23, 1932, after some 30 years of warfare (Wynbrandt, 2021). Until the discovery of oil in 1938, the countries

of the Gulf region, with their harsh desert climate, had limited access to financial resources. However, the revenue from oil grew rapidly from the 1950s, leading to widespread development, especially in infrastructure, education and health care (Wynbrandt, 2021).

1.1.1 Educational System

Before the establishment of schools in Saudi Arabia, parents would send their children to the *Kuttab* (teachers) who focused on memorisation of the Quran. They supervised children in simple settings within mosques or homes, without formal curricula, and rarely taught topics other than Arabic language and religious subjects. During the 1930s, there were only 12 schools across the region, catering for around 700 students (Alamri, 2011). However, the economic changes of the 1950s led to a rapid increase in the number of schools, which came to educate more than 40,000 students (Alamri, 2011). The establishment of the Ministry of Education in 1953 and the appointment of King Fahd ibn Abdulaziz as the first minister marked a new era of reform in the schooling system (Alotaibi, 2015).

Some seventy years later, Saudi Arabia has 36,800 schools and more than half a million teachers across the country, as reported by the Ministry in 2024. Education remains free for all school-age children residing in Saudi Arabia, regardless of their citizenship status (Alamri, 2011). While formal schooling for females was delayed until the establishment of the first girls' school in Riyadh (the capital city) in 1960, female students today enjoy equal educational opportunity with their male peers (Alabdulaziz, 2019; Alamri, 2011). In Saudi Arabia, educational institutions are gender-segregated, with separate schools for male and female students, and their teachers are of the same gender (Alabdulaziz, 2019). Co-education may be the predominant model worldwide, and many argue that it reflects social reality; however, the majority of Saudis support gender-segregation in schools because it aligns with the local traditions and Islamic teachings.

Islamic doctrines and principles also guide the selection of educational content and school curricula (Alyami, 2014). Saudi students across different school levels learn Islamic teachings related to worshipping, duties, relationships with others and financial dealings. Arabic is the official language in schools. Students in Saudi Arabia are introduced to English in elementary school, and it continues to be a standalone subject until graduation from high school. Students can also choose to attend private international schools that are licensed to teach the American or British curriculum using English as the medium of instruction. Other subjects include mathematics, computer science, history, physics, biology, and administrative and social studies (Alabdulaziz, 2019). Students in Saudi Arabia progress through three stages: elementary (six years), middle school (three years) and high school (three years). Parents are also encouraged to enrol their children in preschool and kindergarten starting from the age of four; however, schooling is compulsory between the ages of six and 15 years (Alabdulaziz, 2019).

Until the establishment of the first university in Riyadh (King Saud University) in 1957, students wishing to pursue higher education were sent to study at universities abroad. Since then, the number of local universities has expanded rapidly (Alamri, 2011). During the 1960s and 1970s, the Saudi government allocated a substantial budget to the establishment of a further six universities located in different regions in order to serve the largest possible number of those seeking to pursue tertiary study (Alamri, 2011). Today, there are 31 government universities and 34 private universities and colleges offering hundreds of specialisations (Ministry of Education, 2025c). Of these, several institutions have a good international reputation, with some being ranked among the top universities in the world. In addition to the generous budget allocation for university facilities and the recruitment of faculty from around the world, Saudi students are not required to pay university tuition fees, and they receive a monthly stipend (Alabdulaziz, 2019).

At the same time, the Saudi government appreciates the opportunities that can be achieved from studying in countries with a long-standing history of higher education. Accordingly, the Ministry of Education provides thousands of scholarships for those who seek to study abroad. In 2005, the Ministry launched the King Abdullah Scholarship program, which aimed to meet the demands of the employment market, invest in human capital and promote scientific research and collaboration. The scholarship program was the largest funded program in the world and provided scholarships to over 215,000 students between 2005 and 2018 (Alamri, 2011; Mughal, 2021). Scholarship opportunities continue to be available under recent programs (e.g., Path of Excellence and the Pioneers), and students are offered scholarships to top-ranked universities in countries such as the United States, Australia, Canada and the United Kingdom (Ministry of Education, 2025b). In other words, investment in education has been and remains a priority in Saudi Arabia. For many years, the government has allocated at least a third of the total budget to the educational sector (Basheikh et al., 2021).

1.1.2 Special Education

One of the main Islamic principles is honouring human beings and ensuring equality without regard to any other consideration, such as appearance, colour or race. Islamic societies are also built on the notion of the extended family, which provides solidarity and social support for the elderly and people with special needs. While these teachings have been reflected in Saudi society for centuries, the first attempt to provide formal special education services began only after 1958 (Aldabas, 2015). Blind individuals were the first to benefit, learning Braille from a single instructor who provided evening classes for adults (Aldabas, 2015). This inspired the government to establish Al-Noor, the first school for male blind students, in Riyadh in 1960. In 1962, the government took the important step of establishing a special education department. The department was responsible for supervising and planning

the new institutions that were established for students diagnosed with visual, hearing and intellectual disabilities (Battal, 2016).

While these initiatives were significant in laying the foundation for the subsequent development of special education services, they were limited in scope and predominantly available in the capital city. However, in the following decades, special education services increased in both quantity and quality. By the early 1990s, the number of special education institutes had increased substantially, with over 45 specialised schools providing educational services for 5,730 students across different geographical regions and various disability categories, including both genders (Battal, 2016). At the same time, many advocates in Saudi Arabia began calling for inclusiveness, viewing such specialised and segregated institutions as inappropriate. In response, the Ministry of Education began providing opportunities for many students with mild to moderate disabilities to attend separate classrooms in public schools (Aldabas, 2015).

The subsequent introduction of specific laws and regulations regarding special education and disability rights led to improvements in educational services, diagnosis and financial support (Aldabas, 2015; Alquraini, 2013). In 2001, the Saudi government recognised the urgent need to re-evaluate policies and educational approaches for individuals with special needs in order to reflect international best practice. A team comprising members of the Ministry of Education and some university professors was tasked to establish special education guidelines that fit the local context (Alquraini, 2013).

As previously mentioned, the introduction and enforcement of the RSEPI represented a transformative shift in the development of special education services in Saudi Arabia. Key elements of the RSEPI include ensuring the right of children with special needs to access free and appropriate education, and requiring that educational programs should be based on disability category and severity (Alquraini, 2013). The RSEPI team also defined and

expanded disability categories, encouraged the use of appropriate assessment by qualified experts, and supported the application of scientific research findings to improve special education services. The RSEPI directs school districts to form multidisciplinary teams and adopt individual education plans (IEPs) to meet students' unique learning needs and help them achieve education goals. Overall, the years following the establishment of the RSEPI may be considered the golden era for special education in Saudi Arabia. For instance, the period has witnessed the introduction of Special Education qualifications at universities (Alqahtani et al., 2021), improvements to the quality of school services, and growing student enrolments, which had exceeded 60,000 by 2015 (Battal, 2016).

1.1.3 Special Education Services for Students with Autism

The recognition of autism as a distinct disorder and the development of special educational services for students with autism in Saudi Arabia came much later compared to other disability categories. As explained earlier, the development of special educational services in Saudi Arabia began in the late 1950s. The initial focus on physical impairments gradually expanded during the 1960s to include other categories, such as students with intellectual disabilities. However, the first educational program serving students with autism was not introduced by the Ministry of Education until 2004 (Sulaimani & Gut, 2019). In fact, the first educational programs were initiated by autism advocates and concerned families during the 1990s as a result of the government's inaction in relation to this category of educational provision (Sulaimani & Gut, 2019). The Al-Faisalyah Women's Welfare Society established the first class in Saudi Arabia and the Gulf countries in 1993, using very limited resources to provide instructional teaching for a small number of students with autism (Al-Aoufi, 2011).

It is important to note that, before the establishment of autism-specific educational programs, some students with autism were classified and taught in classrooms for students

with intellectual disabilities (Aldabas, 2015; Sulaimani & Gut, 2019). Gradually, since the dissemination of the RSEPI guidelines, more attention and funds have been directed toward enhancing educational services for students with autism. For example, in 2003, the government established the first three specialised centres for students with autism in Riyadh, Jeddah and Dammam. While these centres were pioneers in providing educational services, they were exclusive settings designed for students with autism and provided no opportunities for inclusion with mainstream students. The early 2000s were also marked by the introduction of an increasing number of special education degrees in the country's universities. Additionally, educational and healthcare institutions began to offer diagnostic services, and the Saudi Autistic Society was established (Al-Aoufi, 2011).

In the following years, and in parallel with a significant rise in autism prevalence and increasing awareness of the disorder, the Ministry of Education expanded educational services for students with autism to include resource rooms and self-contained classrooms (Battal, 2016). This expansion marked a significant shift toward enhancing accessibility for students with autism, particularly in small cities and rural areas. According to the Ministry of Education, and as noted by Battal, 2016, the number of autism educational programs in both separate institutes and self-contained classrooms had grown by 2015 to reach 220 programs providing educational services for over 1,450 students across Saudi Arabia. The government also invested in scholarship programs and research initiatives aiming to promote research in the autism field and enhance the capabilities of professionals working with students with autism, such as teachers, allied health professionals and university professors (Al-Aoufi, 2011; Alanazi, 2020).

Improvement is an ongoing process, and the Ministry of Education has taken important steps in recent years toward qualitative enhancements. Although the RSEPI does not address certain issues, such as the importance of inclusion and early intervention services

or the provision of a least restrictive environment (Aldabas, 2015), the Ministry of Education is currently updating several policies to include providing services for students with autism in the least restrictive environment and offering early intervention services to preschool age groups (Ministry of Education, 2025a). Additionally, teachers of students with autism are now required to implement Individualised Education Programs (IEPs), regularly assess students to determine their strengths and learning needs, and prioritise independent and communication skills (Ministry of Education, 2025a).

Recent years have also witnessed a remarkable enhancement in public school facilities, including classroom equipment and the provision of teaching aids and technologies. In addition, parents can select a private school or choose to seek educational services abroad, and the government covers the cost of school tuition, especially for severe autism conditions that require substantial support (Alnemary et al., 2017). Community awareness in Saudi Arabia has also improved through several initiatives undertaken by government agencies and non-profit organisations, such as conferences, training courses and websites. Collaborations between the Ministry of Education or the Ministry of Health and companies such as Aramco, Riyadh Bank and the Saudi Central Bank have funded the construction and operational support of various autism educational centres and research facilities in Saudi Arabia, such as the Autism Center at King Faisal Specialist Hospital, Shamah Autism Centre and the Autism Center at Johns Hopkins Hospital.

1.2 Challenges and Opportunities in Autism Education and Services in Saudi Arabia

The field of special education has developed significantly in Saudi Arabia over a relatively short period. In particular, there have been important improvements in autism education and diagnosis. However, many challenges and obstacles to further advancements persist (Alanazi, 2020; Sulaimani & Gut, 2019). While these challenges are not unique to autism education in Saudi Arabia and may be common to many countries across the globe,

the following discussion mainly focuses on those issues of particular relevance to the local context of Saudi Arabia.

1.2.1 Challenges in Teachers' Preparation and Training

Teachers in Saudi Arabia face significant challenges in effectively regulating the classroom environment, and in accessing and adopting empirically validated practices to meet the unique needs of students with autism (Alnemary et al., 2017; Alzahrani & Brigham, 2017). Haimour and Obaidat (2013) reported that the knowledge gap related to teaching practices is even more pronounced among general education teachers who work or could work with students with autism compared to special education teachers in Saudi Arabia. This can be attributed to a number of factors, such as recently developed university programs having limited experience in autism teaching and research (Sulaimani & Gut, 2019). In addition, teachers have described the university curriculum as theory-based with limited pre-service training, while in-service teachers have limited access to continuous professional development (Alzahrani & Brigham, 2017; Ibrahim & Alotaibi, 2024). Although the RSEPI highlights the importance of utilising findings from scientific research to improve educational outcomes, it does not address the need for high-quality special education teachers (Alquraini, 2013).

1.2.2 Inclusion Difficulties

Although Saudi policy emphasises the importance of teaching students with autism in an inclusive setting, traditional mainstreaming (partial inclusion in general education classrooms) remains in place (Alnemary et al., 2017). The Ministry of Education, in collaboration with other authorities, continues to fund the establishment of centres that provide services for students with autism in separate buildings. These centres do not offer the multitude of benefits that can be achieved from inclusive settings. However, it should be acknowledged that these centres are well-equipped compared to general education schools,

and they provide a range of supportive services for students with autism, such as speech and language therapy, occupational and physical therapy.

Recent evidence suggests that general education teachers in Saudi Arabia are reluctant to include students with special needs, including students with autism, in their classrooms due to a lack of background knowledge about autism and the appropriate use of related teaching practices and IEPs (Alanazi, 2020). On the other hand, Aldabas (2015) has argued that the problems around educational inclusion in Saudi Arabia have deeper roots in societal attitudes towards disability: "disability acceptance in society plays a vital role in the attainment of the goals of inclusion as most of these goals are modelled on the social aspects of development and coexistence in society" (p. 1163). As Alsolami (2024) has observed, the enhancement of educational inclusiveness in line with international trends requires concerted effort from educational authorities and families to accept, understand and apply inclusion philosophies in practice.

1.2.3 Diagnosis Delays

Autism diagnostic delays may result from insufficient awareness among parents and educators (Sulaimani & Gut, 2019) and difficulties gaining access to diagnostic services (Alnemary et al., 2022). According to Alnemary et al. (2022), the result of late diagnosis is that Saudi children begin to receive educational services on average at age 3.3 years, compared to 2.2 years in the United States. These authors also identify parental income, geographical location and the characteristics and severity of the child's symptoms as factors potentially influencing disparities in the receipt of early diagnosis and intervention. Other challenges to early detection and educational outcomes of children with autism in Saudi Arabia have been identified. These include non-compliance with standardised diagnostic procedures among practitioners (Alsolami, 2024), and the persistence of traditional,

unscientific and stigmatising beliefs about the disorder among parents (Sulaimani & Gut, 2019).

1.2.4 Lack of Community Awareness

Challenges at the macro-level could also be reflected in educational settings and service provision for students with autism. The problem extends to educational circles, where there is a lack of understanding and implementation of evidence-based practices to support these children (Alnemary et al., 2022). Hassan (2019) attributes this in part to the fact that most autism research is published in English and predominantly represents a Western socio-cultural context. This has created a knowledge gap in Arabic-speaking countries and impacted autism practices and services at various levels. Although autism prevalence has drawn increased attention to the condition in Saudi Arabia, this has not been accompanied by conscious and structured efforts to disseminate knowledge of evidence-based interventions, clarify the role of early detection and intervention, and determine the roles and potential challenges for parents and educators (Alsolami, 2024).

1.2.5 Vision 2030 as an Opportunity to Enhance Autism Education and Research

The economy of Saudi Arabia is based on massive oil revenues, which have enabled the country to progress rapidly on many fronts over the last few decades. However, the 2014 oil price collapse and the coronavirus pandemic later significantly impacted the Saudi economy. In response, the Saudi Vision 2030 was launched in 2016 to create a more diversified and sustainable economy (Grand & Wolff, 2020). The vision prioritises the development of human capabilities. In the context of education, the government recognised that the current education system requires significant reform (Allmnakrah & Evers, 2020). The Saudi Vision 2030 has many initiatives and targets, including identifying students with special needs, ensuring their right to inclusive education, and providing equal and high-quality educational opportunities (Saudi Vision 2030, 2016). As Abu-Alghayth and

Alshahrani (2024) note, enhancing the educational system for students with special needs aligns with the wider goals of Vision 2030, which explicitly connects educational reform with economic development.

To achieve these goals, scholars have argued, a number of key issues need to be addressed. First, existing regulations affecting students with autism need to be amended to allow for the gradual development of policy-focused research (Abu-Alghayth & Alshahrani, 2024). In line with the strategic direction of Vision 2030, Alsolami (2024) suggests utilising research findings to drive transformation in autism education. This includes identifying knowledge gaps, evaluating educational models and curricula to inform future development, identifying needs and challenges and enhancing collaboration efforts among key stakeholders in the educational field. Allmnakrah and Evers (2020) emphasise the critical importance of involving teachers in any successful educational reform. They describe the failure to include teachers' voices as a "huge mistake" (p. 29), since they are the most powerful driving forces in the education system. Teachers should actively participate in decision-making and draw on their experience to inform discussions of teaching issues, challenges and training needs.

1.3 Aims and Significance of the Study

The study had two broad aims. The first aim was to measure knowledge and use of teaching practices, including EBPs, among teachers of students with autism in Saudi Arabia. The second aim was to identify the barriers to and facilitators of EBPs implementation. The findings were expected to inform strategies for bridging the research-to-practice gap in autism education.

The findings have the potential to initiate a dialogue about an underexplored area in autism educational research in Saudi Arabia. It will also contribute to enriching the existing literature on autism education. In the broader context, the literature has repeatedly emphasised the need for expanding the database to inform improvements in both educational

services and interventions in Saudi Arabia and other developing countries (Kelly et al., 2024; Sulaimani & Gut, 2019; Zakirova-Engstrand & Yakubova, 2024). More specifically, the findings of the study may offer valuable insight into teachers' knowledge and use of EBPs and other teaching practice categories. The qualitative findings could also bring teachers' perspectives into the academic literature, particularly regarding what they perceived as contextual barriers and facilitators for implementing EBPs in school settings.

As such, the findings have the potential to inform policy and practice around autism education in Saudi Arabia. As Boyd et al. (2022) have pointed out, the successful implementation of EBPs in autism classrooms is dependent on elements at various levels. These include the active role and support of leadership in developing and implementing policies and practices that enable the effective adoption of EBPs. Although there is no claim that the present findings are more widely generalisable, they provide a foundation for the development of contextually grounded policies that enhance the adoption and implementation of EBPs. In this context, a potentially significant contribution is to highlight the practical value of including the voices of teachers in decision-making, especially in relation to identifying contextual factors that impact on needs for training, resources and technical support. By identifying the barriers to successful implementation of EBPs in Saudi classrooms, the study could make a significant contribution to students' engagement, confidence and overall learning outcomes.

Finally, the study's aims align with the call for more research on the factors influencing the implementation and sustainment of EBPs in autism education settings. Specifically, many prominent voices in the field advocate for the use of implementation science frameworks and models to reduce the gap between knowledge and practice (Boyd et al., 2022; Guldberg, 2017; Odom et al., 2020) and to make EBPs "a default choice and part of therapeutic routine" (Luskin-Saxby & Paynter, 2018, p. 2). This requires a body of evidence

to inform rigorous and systematic planning and execution of knowledge translation procedures. The adoption of the knowledge-to-action (KTA) framework in this study addresses this issue and provides a model for the design of future research exploring knowledge transferability in autism education.

1.4 Research Questions and Methods

The study employed a mixed methods design to address three main research questions relating to the implementation of EBPs by teachers of students with autism in Saudi Arabia.

- How do teachers of students with autism in Saudi Arabia rate their knowledge and use of evidence-based, emerging and unsupported practices?

    Sub-question: How do demographic factors such as gender, years of experience, and employment sector relate to the reported knowledge and use of evidence-based, emerging and unsupported practices?

- What do teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs?
- What strategies do teachers of students with autism in Saudi Arabia recommend for supporting the implementation of EBPs?

The first question was answered by collecting quantitative data on Saudi teachers' knowledge and teaching practices and the impact of demographic factors on their reported knowledge and use. The second and third questions were explored by collecting qualitative data on teachers' perceptions of questions aimed to gain a deeper understanding of the implementation barriers and facilitators of EBPs.

1.5 Theoretical Framework

The theoretical framework adopted in a research study plays a pivotal role in guiding the research design and methods, as well as enhancing the interpretation of findings.

According to Ali et al. (2022), “without the use of an appropriate theory or conceptual/theoretical framework, the research becomes less convincing, less sound and less validated” (p. 49). The design of the current study was guided by the principles of Implementation Science (IS), which has been demonstrated in previous research to provide appropriate structural plans and tools to examine the integration of EBPs into practice routines (McNett et al., 2021). Implementation science is "the scientific study of methods to promote the systematic uptake of research findings and other EBP into routine practice" (Eccles & Mittman, 2006, p. 1). Researchers are advised to select implementation techniques based on their ultimate target, the type of changes they desire to accomplish, and anticipated behaviour changes in a particular context (Wilson & Kislov, 2022). IS has the potential to assist various aspects of the knowledge translation process, from identifying the research-to-practice gap to designing intervention phases and interpreting research findings (Moullin et al., 2020).

1.5.1 Rationale for Selecting IS Methods

Numerous challenges are involved in translating research knowledge of any kind into real-world applications. IS is specifically oriented toward achieving this outcome. IS methods focus on identifying mechanisms for adopting and sustaining the use of research knowledge that involve systematically planned changes designed to overcome users’ resistance (Bauer et al., 2015). Initially developed to steer knowledge translation in the health field, IS has been promoted as suitable for application in educational settings with some context-based methodological adaptations (Boyd et al., 2022; Brookman-Frazee & Stahmer, 2018; Luskin-Saxby & Paynter, 2018; Odom et al., 2020). However, few IS models and frameworks have been tested in education research generally, and autism research in particular. As such, researchers seeking to transition from the science of efficacy to the science of implementation in autism education research will encounter numerous challenges (Boyd et al., 2022).

One of the challenges IS researchers encounter is the selection of an appropriate theory to guide the research process and align with their research questions. According to Birken et al. (2017), "the underuse, superficial use, and misuse of theories pose a substantial scientific challenge for implementation science and may relate to challenges in selecting from the many theories in the field" (p. 1). To address this concern, Moullin et al. (2020) suggest several points to consider before making one's selection. They encourage researchers to comprehensively understand the purpose and functionality of the framework to ensure it serves their research intent and aligns with the research aim. The suitability of a framework also depends on assessing the analytical depth, scope, and level of detail that is desired.

1.5.2 Knowledge-to-Action Framework

Given these considerations, relevant components of the Knowledge-to-Action (KTA) Framework (Graham et al., 2006) were deemed appropriate to guide the present investigation, including its procedures, method and research questions. Its key features are elaborated below.

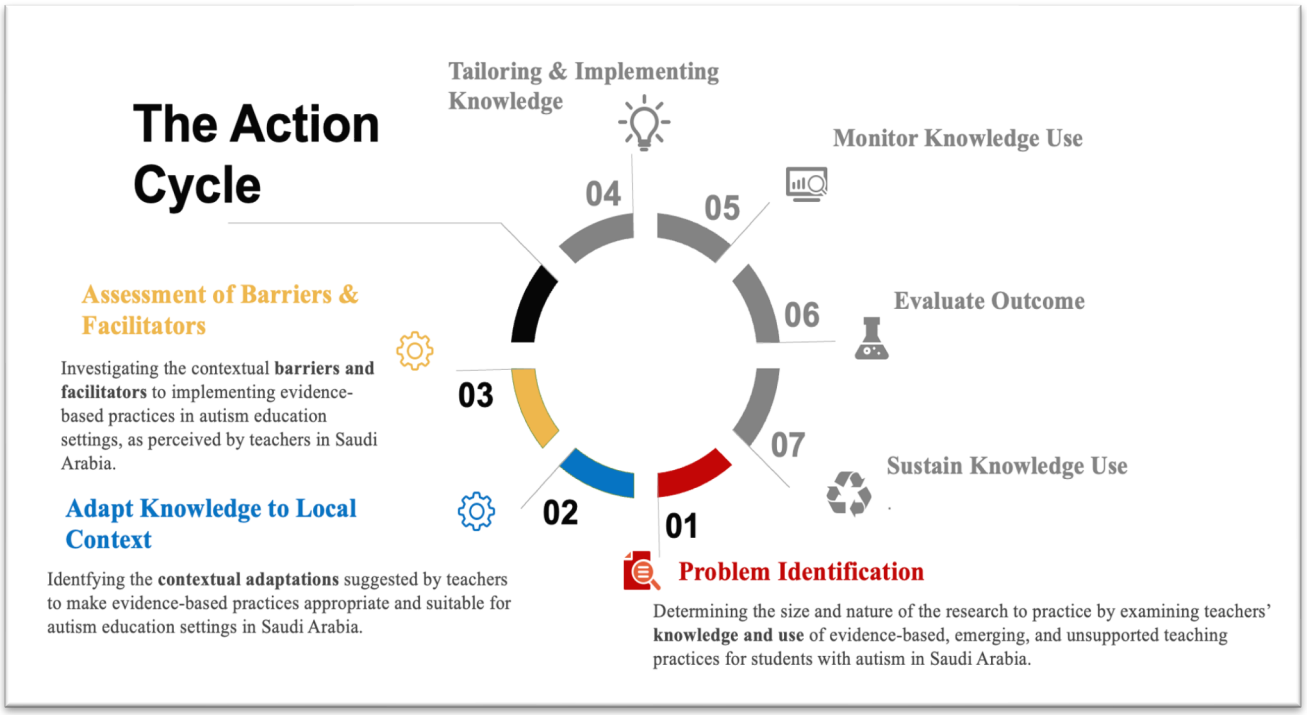
The KTA framework provides clear steps with detailed, replicable guidelines that aim to integrate research knowledge into routine practice through two components, Knowledge Creation and the Action Cycle, each of which contains various phases (Graham et al., 2006). The knowledge creation process has three stages: 1) knowledge inquiry (the acquisition of primary knowledge); 2) knowledge synthesis (the process of filtering acquired research knowledge, e.g., meta-analysis and systematic reviews); and 3) knowledge tools and products (guidelines and clear and easy recommendations for users). The action cycle comprises seven dynamic and interactive steps: identifying the problem or the needs; adapting knowledge to the local context; assessing barriers and facilitators; selecting and implementing interventions; monitoring; evaluating; and sustaining knowledge use.

The field of autism has progressed beyond the primary stages of knowledge creation and, during the last two decades, numerous meta-analyses have been published (Boyd et al., 2022). According to Odom et al. (2020), a sizable number of teaching practices that meet rigorous methodological criteria have emerged in the literature and have been translated into actionable products and guidelines. As such, it is desirable for future research to adopt established methods and theories to enhance knowledge translation. Hundreds of research projects have utilised the KTA framework to put research knowledge into practical use (Milat & Li, 2017). In Australia, Luskin-Saxby and Paynter (2018) developed a model for future research on implementing EBPs in autism in early intervention centres based on the KTA framework. However, a citation analysis and systematic review investigating the KTA framework found that it had been implemented with varying degrees of completeness: few studies used the KTA framework in its entirety, most having partially adapted it, combined it with other frameworks, or used it as a study design planning tool (Field et al., 2014).

The present study adopted that part of the KTA framework that contributed directly to answering the research questions and achieving the research objectives. Specifically, the first three phases of the Action Cycle of the KTA framework were employed as the primary framework. In addition, aspects of the ADAPT process model (Moore et al., 2021) and the multilevel conceptual framework (Domitrovich et al., 2008) informed the development of the qualitative investigation of the barriers to and facilitators of EBPs implementation in the school context. Figure 1.1 shows the action cycle components and the relevance of the first three phases to the study's aims. Also, Figure 1.2 displays the theoretical and methodological components and their alignment to the study's research questions.

Figure 1.1

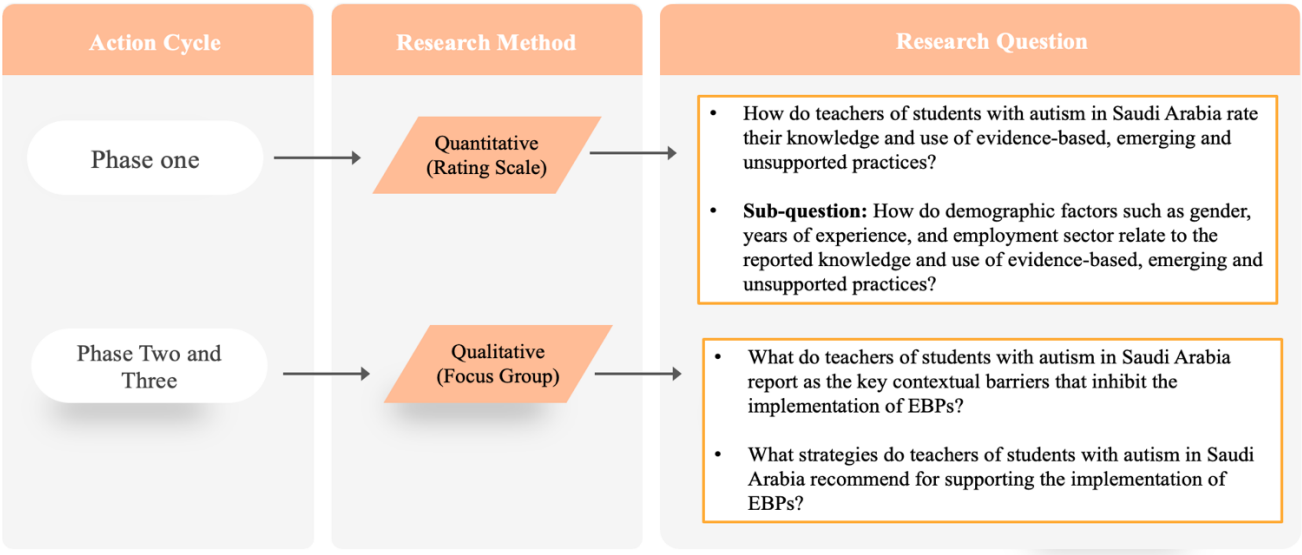
The Action Cycle of the KTA Framework



Note. This figure displays the action cycle adapted from Graham et al. (2006) and the application of the first three phases in the current study.

Figure 1.2

Theoretical and Methodological Components Employed in the Current Study



Note. This figure displays the action cycle phases in alignment with the research methods.

1.6 Key Terms and Definitions

Evidence-Based Practices: Teaching practices (single-session or package intervention) that have been proven by high-quality scientific research and which meet inclusion criteria as determined by reviewers to be effective in enhancing outcomes of students with autism.

Emerging Practices: Teaching practices that have some research support and potential effectiveness but have not yet proven to be fully qualified to meet the inclusion criteria of evidence-based practices.

Unsupported Practices: Teaching practices that lack scientific support and evidence of effectiveness or have proven to be harmful regardless of their popularity and traditional use in autism educational settings.

Implementation Science: The field of studying how knowledge obtained from scientific research can be integrated into practice in real-world settings. The field aims to bridge the gap between knowledge and practice by understanding implementation barriers and adopting facilitators through cautious and planned guidelines presented within related theories, models and frameworks.

Knowledge to Action Cycle: Framework developed by Ian Graham to monitor phases of knowledge creation and provide systemic steps to transfer research evidence into practice. The action cycle involves iterative and flexible phases, including problem identification, adaptation, implementation, evaluation and sustainment of research knowledge.

Autism: The term Autism is defined as a neurodevelopmental disorder characterised by persistent challenges in social communication and interaction, repetitive behaviours and activities, and restricted interests.

Autism Heterogeneity: This term refers to the presentation of diverse symptoms among individuals diagnosed with autism, exhibiting broad ranges of behavioural, developmental and cognitive abilities as well as variations in symptom severity and onset.

Teachers of Students with Autism: In-service teachers who work directly with students with autism toward educational or behavioural goals in recognised and authorised institutions within the government or private sectors.

Autism Centres: In the context of this study and primarily when referring to educational settings in Saudi Arabia, autism centres are facilities that provide educational and other supportive services in segregated settings (i.e. non-inclusive services).

Reflexive Thematic Analysis: A qualitative research method used to analyse and interpret raw data into developed themes. The steps of reflexive analysis, starting from data familiarisation and progressing through code and theme development, are characterised by the researcher's subjectivity and engagement with the obtained data.

Descriptive Analysis: The use of basic quantitative analysis methods, such as frequencies, means, central tendencies and measures of spread, to identify characteristics and patterns and to summarise data for further and more advanced analysis.

Inferential Analysis: Statistical methods used in quantitative analysis to draw conclusions about the population, make estimates, and test hypotheses. Inferential analysis in this study refers to the use of techniques, such as t-test, repeated measures ANOVA and Pearson's correlation coefficient to compare groups' means and measure correlations.

1.6.1 A Note on Terminologies

The term 'autism spectrum disorder' is widely used in the literature to denote the heterogeneity in autism characteristics and their associated strengths and weaknesses, which indicate the need for different levels of support. In this thesis, however, the term 'autism' is preferred, for several reasons. First, 'autism' is the term most commonly used in an educational context in Saudi Arabia. Second, the word 'disorder' implies an impairment, and is seen as belonging to a deficit-based terminology that can be harmful and stigmatising for many individuals on the spectrum (Kenny et al., 2016).

Additionally, the thesis employs person-first language, such as individuals with autism or students with autism, rather than identity-first language, such as autistic students. There is no consensus within the autism community or among researchers on the correct or preferred use of this terminology (Bottema-Beutel et al., 2020). However, it has been argued that the former usage promotes dignity and reduces discrimination by introducing and honouring the person first (Dunn & Andrews, 2015). Further, in the present context, the term 'students with autism' better aligns with the perspective of the study participants (teachers).

1.7 Organisation of the Thesis

This thesis is structured into seven chapters. Chapter 2 reviews related literature on autism, evidence-based practices and IS theories and frameworks, and identifies the research gap addressed in the present study. Chapter 3 describes the research design, justifies the selection of a mixed-methods approach, discusses the ethical considerations involved in the study, and describes the methods and procedures related to the quantitative investigation. Chapter 4 details the collection of qualitative data from focus group discussions, including sampling, setting, content and procedures. Chapter 5 explains the method of quantitative data analysis and presents the results of this analysis. Chapter 6 explains the method of qualitative data analysis and presents the findings from this procedure. Chapter 7 discusses the main findings in relation to the research questions, compares these results with previous literature, considers the implications and limitations of the study, and makes recommendations for future research.

Chapter 2: Literature Review

This chapter reviews the relevant literature. The first section discusses the historical background of autism and the initial discovery of the autism condition. This includes the contributions of many pioneers, such as Kanner and Asperger, as well as the gradual emergence of the diagnostic category of autism. The section concludes with an examination of the prevalence of autism and of current trends in understanding the condition.

The third section addresses the gap in autism education and factors that influence the implementation of EBPs in school settings. The current status of EBPs' knowledge and use in Saudi Arabia, as well as implementation barriers, is also discussed. Additionally, this section highlights the need for a paradigm shift in autism education research to bridge the current disparity between research and practice. It concludes with a detailed discussion of the use of implementation science theories and models in autism education. The second section is devoted to a critical review of the literature on evidence-based practices (EBPs) in autism education. The first part focuses on the policy context and the factors behind the creation of legislation to support the use of EBPs in educational settings. Some of the earliest contributions to teaching children with autism and identifying EBPs are explored. This is followed by a description and analysis of several seminal reviews of EBPs research published from the early 2000s to the present, along with the rationale for the EBPs' use. The purpose of the review is to provide a chronological overview of the evolution of EBPs in autism and to identify the strengths and limitations of relevant research.

The third section addresses the gap in autism education and factors that influence the implementation of EBPs in school settings. The current status of EBPs' knowledge and use in Saudi Arabia, as well as implementation barriers, is also discussed. Additionally, this section highlights the need for a paradigm shift in autism education research to bridge the current

disparity between research and practice. It concludes with a detailed discussion of the use of implementation science theories and models in autism education.

2.1 Diagnosing Autism: Historical Background

Swiss psychiatrist Eugen Bleuler coined the term autism in 1911 when he attempted to describe schizophrenic symptoms (Chown, 2012). The term comes from the Greek word autos, which means "self", and refers to situations in which a person is socially isolated (Chown, 2012; Vatanoglu-Lutz et al., 2014). However, the current understanding of autism does not align with the symptoms of the patients that Bleuler described.

As early as the 1940s, Kanner (1943) published a paper on autism that challenged Bleuler's perspective. In this seminal paper, Kanner described his clinical observations of a small group of children with a common behavioural pattern that manifests at an early age of life, which he called "early infantile autism". Subsequently, he reported that Bleuler's description "does not quite account for the status of our patients. For one thing, withdrawal implies a removal of oneself from previous participation. These children have never participated. They have begun their existence without the universal signs of infantile response" (Kanner, 1965, p. 412). After Kanner's findings were published, there was a gradual but noticeable shift in people's understanding of the condition of autism (Thompson, 2013).

2.1.1 The Wild Boy of Aveyron

The literature contains occasional examples of individual children whose behaviours matched those described by Kanner (Wing, 1993). Doctor Itard, in 1802, reported one of the earliest human cases of autistic-like symptoms (Feinstein, 2010). His work with Victor, the so-called "wild boy of Aveyron", whose symptoms aligned with those of autism, represents one of the most significant examples of the use of structured intervention to teach academic, language, social and daily life skills (Wolff, 2004). In this report, Itard described Aveyron as

having low responsiveness to olfactory and visual stimuli, limited language development, a preference for sameness, an inability to imitate, and a propensity for stimming and repetitive behaviour (Wolff, 2004). Although Itard did not classify it as a distinct condition, he provided the first comprehensive account of autism's distinguishing traits (Thompson, 2013).

2.1.2 Kanner's Perspective

There is general agreement that Kanner's early observations about autism marked a turning point in the development of child psychiatry, as his publication established the first concrete diagnostic criteria for autism (Feinstein, 2010). Kanner, originally from Austria, immigrated to the United States and established his reputation in the field of child psychiatry after his appointment to Johns Hopkins University in 1930 (Sikora, 2015). His (1943) seminal report, "Autistic disturbances of affective contact", included a detailed description of 11 children, eight boys and three girls, who shared unique symptoms that had never previously been described. He argued that "these characteristics form a unique 'syndrome', not heretofore reported, which seems to be rare enough, yet is probably more frequent than is indicated by the paucity of observed cases" (Kanner, 1943, p. 242). Kanner reported the following five distinct symptoms as diagnostic criteria for infantile autism:

- Lack of emotional connection
- Pathological need for sameness and routine
- preoccupation with objects
- Delay and unnatural language that impact interaction with others
- Exceptional learning potential and an excellent memory (Wing, 1993).

According to Kanner, the inability of children to form normal relationships with others was the fundamental feature shared by all cases in his research sample. This observation appeared multiple times throughout his original paper in relation to what he referred to as extreme autistic aloneness (Feinstein, 2010). Kanner even went so far as to

suggest that a child's hypersensitivity to noise was correlated with an innate need for isolation (Blacher & Christensen, 2011). He believed that autism was a biological condition: these "children have come into the world with an innate inability to form the usual, biologically provided affective contact with people, just as other children come into the world with innate physical or intellectual handicaps'' (Kanner, 1943, p. 250). As a result of this challenge to the prevailing psychoanalytic view, there was a fundamental shift towards an understanding of the genetic basis of autism (Harris, 2018).

Kanner's original description of infantile autism has, however, been widely criticised. Feinstein (2010) has summarised the main points of this critique. One of the most common objections is that Kanner implies that the children in his sample had high intellectual capacity and came from high socioeconomic status backgrounds. This was subsequently attributed to the fact that the parents who sought his assistance comprised a group of well-educated professionals who were familiar with his work. In addition, since individuals with autism tend to focus intensely on narrow topics, Kanner incorrectly assumed that they were of superior intelligence and possessed high learning potential.

Kanner also claimed that the children he had observed throughout his longitudinal study frequently came from parents who lacked compassion: "one other fact stands out prominently. In the whole group, there are few really warm-hearted fathers and mothers" (Kanner, 1943, p. 250). In the same context, he described the parents of his patients as people who are excessively interested in science and literacy but less so in people.

Kanner first used the term, refrigerator mother, decades before Bruno Bettelheim's exploitative use of the concept (Feinstein, 2010). In Bettelheim's Freudian psychoanalytical approach, autism was due to emotional factors such as cold mothers, as well as over- or under-stimulating home environments (Bettelheim, 1967); as such, the blame lay with mothers and fathers. Michael Rutter opposed this view, arguing that *cold parenting* was not a

genuine risk factor, and that Kanner's description of parents could be incorporated into a broader standard autism phenotype (Feinstein, 2010; Sucksmith et al., 2011). Kanner subsequently emphasised his belief that infantile autism was primarily innate, and that the fact that individual parents had certain characteristics did not necessarily imply a cause-and-effect relationship (Feinstein, 2010).

In summarising the findings of his study, Kanner (1943) insisted that establishing the role of prenatal relationships in the development of autism required further research: “the question arises whether or to what extent this fact has contributed to the condition of the children” (Kanner, 1943, p. 250). Rutter suggests that these apparent shifts in Kanner’s position are evidence of his honesty (Feinstein, 2010). Overall, however, Kanner's (1943) seminal work paved the way for researchers to better understand this neurodevelopmental disorder. His pioneering research was critical in furthering our understanding of autism, and his contribution continues to be reflected in current methods of studying and diagnosing the condition (Blacher & Christensen, 2011).

2.1.3 Asperger’s Perspective

One of the most striking paradoxes in the history of research on autism is the fact that Hans Asperger published a diagnosis that was very similar to Kanner's syndrome one year after the latter had published his findings on infantile autism. Asperger coined the term autistic psychopathy to describe the children he observed, clearly distinguishing the syndrome from childhood schizophrenia (Blacher & Christensen, 2011). Asperger's work went unnoticed for nearly four decades, primarily because it was initially published in German and therefore inaccessible to researchers in English-speaking countries (Robison, 2017). Lorna Wing eventually introduced his work in 1981 by coining the term Asperger's syndrome, thereby marking a turning point in the dissemination of his research to the broader scientific community (Wing, 1981).

Asperger (1944) developed his definition of autistic psychopathy from his analysis of the behaviour of four boys between the ages of six and eleven. Specifically, he defined it as characterised by the following traits: impaired social interactions; abnormal use of language and poor nonverbal communication; an obsession with a favourite subject; attachment to routine and repetitive behaviour; clumsiness and poor motor skills; and excellent memory (Wing, 1981). Asperger also asserted that boys were noticeably more likely than girls to develop the syndrome, describing it as “an extreme male variant of masculine intelligence, of masculine character” (Feinstein, 2010, p. 29).

In contrast to Kanner, Asperger believed that the symptoms of autism psychopathy were not detectable in infants and might not become apparent in a child until at least the age of three (Wing, 1981). In addition to the age at which a person could be diagnosed, Asperger differed from Kanner in other respects. He described all the children as having early speech development, advanced vocabulary, and acceptable grammar (Wing, 1991). Because they could go into such depth when discussing their passion, he called them little professors (Vatanoglu-Lutz et al., 2014). In contrast, Kanner (1943) described some of the children he had observed as being completely mute. In contrast to the typical description of Kanner's children, whom he characterised as bright and attractive, Asperger commented on the "odd" appearance of the children he had observed (Wing, 1991).

Wing (1991) has identified ten key similarities between Asperger's and Kanner's observations, emphasising that, despite a few important differences, the symptoms observed by both pioneers were remarkably similar, leading her to suggest that both disorders should be incorporated into an autistic spectrum (Feinstein, 2010). As well as describing comparable autistic characteristics, Kanner and Asperger also agreed that the condition was more prevalent in males, must be differentiated from schizophrenia, and was appropriately identified by the term "autism" (Feinstein, 2010; Kanner, 1943; Wing, 1981, 1991).

The following section examines the diagnosis of autism through the lens of successive editions of the DSM. The DSM was selected as the primary framework for examining the history of autism for several reasons. First, the DSM is widely employed in both clinical and educational research and practice and is recognised internationally as an authoritative framework (Lord & Bishop, 2015; Volkmar & McPartland, 2014). Second, the DSM has remained the dominant diagnostic framework in the educational and health sectors in Saudi Arabia for many decades (Al-Salehi et al., 2009). It is currently utilised across various settings, has been translated into Arabic, and has been modified through advanced research to ensure its cultural relevance for the Saudi population.

Second, the DSM provides operationalised criteria that allow for comparison of historical changes and their impact on diagnosis and interventions. This is important as while autism research consistently highlights the increase in prevalence, it often fails to consider the direct impact of ongoing changes in diagnostic criteria (Hansen et al., 2015). In this thesis, use of the DSM has allowed for the exploration of various explanations for the rise in the prevalence of autism and the heterogeneity of its symptoms, both of which influence the educational services provided for students with autism worldwide (Dingfelder & Mandell, 2011a; Waterhouse, 2012). Further, the employment of the DSM in the present context aligns with the focus on the scientific development of EBPs over several decades.

2.1.4 Initial Inclusion of Autism in the DSM-III

Autism was first described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980 (American Psychiatric Association [APA], 1980). Evidence presented in the 1970s by Michael Rutter, Andreas Rett, Bernard Rimland and others spurred the development of more precise diagnostic criteria for autism (Rosen et al., 2021). More specifically, Rutter (1978) proposed a revised definition of autism that took account of the early onset of restricted interests and repetitive behaviours, as well as social and language

delays beyond those seen in typically developing children. The diagnostic criteria for infantile autism in the DSM-III were heavily influenced by both Rutter's (1978) study and Kanner's early published work (Volkmar et al., 1992b).

The DSM-III adopted the term Pervasive Developmental Disorder (PDD) to describe the group of disorders into which infantile autism was initially classified (Volkmar & McPartland, 2014). The DSM-III defines Pervasive Developmental Disorder broadly, characterising the features of all its subcategories as "distortions in the development of multiple basic psychological functions that are involved in the development of social skills and language, such as attention, perception, reality testing, and motor movement" (APA, 1980, p. 86). These related disorders were classified into four categories under the umbrella of PDD: Infantile Autism (IA); Atypical PDD; Childhood-Onset PDD; and Residual States (APA, 1980).

One of these subtypes, infantile autism, derives its name from the fact that symptoms of the disorder manifest in infancy. A subcategory called Residual Infantile Autism was also created to classify cases in which children initially met the criteria for infantile autism but were later found to have acquired some skills, resulting in a more complex form of autism due to later-stage development. Children who did not exhibit autistic symptoms as infants but developed autistic characteristics later in life were given the diagnosis of Childhood-Onset PDD (Volkmar & McPartland, 2014). Finally, Atypical PDD was used as a "catch-all" diagnosis for children who did not fully fit the criteria for infantile autism or childhood-onset PDD (Rosen et al., 2021).

The criteria proposed in DSM-III were rigid insofar as every criterion had to be satisfied to obtain a diagnosis. This served as a potential barrier to the development of flexible diagnostic procedures (Volkmar & McPartland, 2014). The DSM-III has been criticised for not providing sufficient justification for the separate category of childhood-

onset PDD and for the residual autism category, failing to account for the persistent difficulties experienced by individuals with autism as they age (Rosen et al., 2021). All these concerns prompted several substantial revisions, as reflected in the publication of the third edition of the Revised Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) in 1987.

2.1.5 Revised Autism Diagnostic Criteria in the DSM-III-R

One major revision that appeared in DSM-III-R was the replacement of Infantile Autism with Autism Disorder. The change in terminology has had far-reaching effects, one of which is a more accurate reflection of the necessity for "a more flexible and developmentally oriented approach that would be useful across ages and developmental levels" (Rosen et al., 2021, p. 4255). A total of 16 symptoms was proposed for inclusion in the DSM-III-R as diagnostic criteria for autism disorder (Volkmar & McPartland, 2014), each symptom being assigned to one of three broad categories of dysfunction: qualitative impairment in social interaction; impairments in verbal and nonverbal communication; and markedly restricted activities and interests (American Psychiatric Association [APA], 1987). A child must satisfy eight criteria before receiving a diagnosis of Autism Disorder. At least two criteria need to come from the social category, and at least one criterion is required to come from each of the other two categories (Volkmar & McPartland, 2014).

DSM-III-R also introduced a new diagnostic category, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), to include those who manifested a qualitative impairment in reciprocal social interaction and communicative skills but did not satisfy all the diagnostic criteria for Autism Disorder (Hertzig et al., 1990). Even though the DSM-III specifies stereotypical and repetitive activities and attachment to routine as core diagnostic criteria for PDD, these features are not required to receive a diagnosis of PDD-NOS (Blacher & Christensen, 2011). The DSM-III-R also revised the age at which autism symptoms could

be manifested, expanding the diagnostic window from infancy to childhood (Blacher & Christensen, 2011). By replacing the concept of Infantile Autism with the new terminology Autism Disorder, the DSM III-R placed greater emphasis on a developmental approach that was not restricted to the youngest children or specific developmental levels (Volkmar & McPartland, 2014). Another positive development was the substitution of the term "qualitative impairment" for "pervasive lack" to indicate difficulties with reciprocal social interaction and verbal and nonverbal communication. This alteration thereby promotes a less rigid approach to diagnosis (Verhoeff, 2013).

While the DSM-III-R resolved many issues, a serious concern was subsequently raised that the proposed criteria might lead to an increase in the number of false positive cases, as well as the underdiagnosis of children at the low end of the intelligence curve (Volkmar & Reichow, 2013). Therefore, the DSM-IV (APA, 1994) introduced a new diagnostic criterion that was more sensitive to variability. Autism researchers from a variety of fields drew on the results of a field trial, data reanalysis, and literature reviews to address a wide range of problems from the very beginning (Rosen et al., 2021; Volkmar et al., 1994).

2.1.6 DSM-IV Diagnostic Criteria for Autism

In the DSM-IV (APA, 1994), five new diagnostic categories were introduced within the Pervasive Developmental Disorders (PDDs) classification: Autism Spectrum Disorder, Asperger's Disorder, PDD-NOS, Rett's Syndrome, and Childhood Disintegrative Disorder. The diagnostic criteria for each subcategory of PDD are distinct, albeit overlapping, and are primarily based on the individual's pattern of observable behaviours and, to a lesser extent, their chronological age of manifestation. For example, the DSM-VI specifies that a child must meet at least six items across three multicomponent diagnostic criteria to be diagnosed with autistic disorder. The DSM-IV also specifies that Autistic Disorder symptoms must have

been present before the age of three and that these symptoms cannot be better explained by Rett's Disorder or Childhood Disintegrative Disorder.

The term Asperger's syndrome was first proposed by Wing (1981) as a replacement for the older term Autistic Psychopathy. Prior to the release of the DSM-IV, studies had failed to clarify the distinctions between Asperger's syndrome and autism due to the use of inconsistent definitions (Mayes et al., 2001). The inclusion of Asperger's as a new diagnostic category in the DSM-IV was controversial. Despite numerous attempts to establish diagnostic criteria for Asperger syndrome, no consensus has been reached (Rosen et al., 2021). For the first time, the DSM-IV included Asperger disorder as its own distinct diagnosis under the PDD heading in 1994 (APA, 1994). This conclusion was reached after a thorough differential diagnosis was conducted, comparing data from 50 cases with a history of Asperger disorder with data from other cases of autism and PDD-NOS (Rosen et al., 2021).

To meet the DSM-IV diagnostic criteria for Asperger syndrome, two items from the list of Social Impairment symptoms and one item from the list of Restricted and Repetitive Behaviour and Interests' symptoms must be present. Moreover, research interest in the Asperger condition increased dramatically after the publication of the DSM-IV in 1994, going from "fewer than 100 scientific papers from 1944 to 1993 to approximately 1,700 after 1994, when the DSM-IV appeared" (Volkmar & McPartland, 2014, p. 201). However, in terms of improving clinical practice, a great deal of scepticism and a lack of consensus led to questions about the sensitivity and specificity of the DSM-IV criteria in successfully diagnosing Asperger syndrome (Mayes et al., 2001).

2.1.7 DSM-5 Diagnosis Criteria: A Dimensional Approach

The DSM-IV underwent some minor textual revisions in the year 2000. However, none of the diagnostic criteria or subtypes were changed in this revision, nor were most of the research community's recommendations for diagnostic improvements considered. In contrast,

the DSM-5 (American Psychiatric Association [APA], 2013) represented a significant change not only in how autism is conceptualised but also in the terminology, diagnostic criteria and severity levels of the disorder (Rosen et al., 2021). The diagnosis of Pervasive Developmental Disorder (PDD) was entirely removed from the manual and replaced with Autism Spectrum Disorder (ASD) (APA, 2013). This was not just a linguistic shift; it also reflected the consolidation of the PDD subgroups previously recognised in the DSM-IV into a single diagnosis (Lord & Bishop, 2015). However, Rett is no longer part of this new classification (Harris, 2018). Its removal from the DSM-5 was prompted by the discovery of a genetic aetiology after its short life in the PDD classification (Volkmar & McPartland, 2014).

According to Rosen et al. (2021), this change in terminology, the merging of subcategories and the shift from a categorical to a dimensional approach in the DSM-5 resulted from a combination of factors that had been identified in a number of studies. The DSM-IV and its later revision had created three diagnostic categories: Qualitative Impairment in Social Interaction, Qualitative Impairment in Communication, and Restricted Repetitive Behaviours (American Psychiatric Association, 1994). However, the DSM-5 committee reduced this number to two domains, on the grounds that the social and communication domains were explained by the same factor, which included verbal and nonverbal forms of communication and social behaviours (Lord & Bishop, 2015). According to the DSM-5, a person with persistent difficulties in social communication and interaction (first diagnostic domain) must show difficulties in social-emotional reciprocity. The updated DSM-5-TR, published in 2022, added two new words to the first criterion to describe the presence of all diagnostic items that fall under the social and communication impairment criterion. This change involved replacing the original expression, "as manifested by the following", with "as manifested by all of the following" (First et al., 2022).

In addition, the DSM-5 shifted from a categorical to a dimensional approach to allow for fewer, yet broader diagnostic criteria in the definition of ASD (Lord & Bishop, 2015). The second domain of diagnostic criteria for ASD is *restricted and repetitive patterns of behaviour, interests or activities*. Two of the following symptoms must be present to satisfy this domain: repetitive behavioural movements, a propensity towards sameness and routine, a fixation on a single topic or interest, and atypical responses to sensory stimuli (APA, 2013). In line with Kanner's initial description of infantile autism, the DSM-5 eventually recognised hypo- or hypersensitivity to sensory stimuli as one of the diagnostic criteria for ASD. Numerous systematic reviews supported the inclusion of this domain, as these behaviours are prevalent in children with ASD and differentiate ASD from other psychological disorders (Esler & Ruble, 2015).

2.1.7.1 Severity Specifiers and Age of Onset

The DSM-5 encourages clinicians to include meaningful details of diagnostic specifiers, for example, comorbid impairments such as neurodevelopmental, mental and behavioural disorders (Esler & Ruble, 2015). In addition, it recommends the use of severity specifiers for both the social communication and restricted, repetitive behaviour domains in order to ascertain the impact of a deficit on a person’s ability to carry out daily activities. The DSM-5 adopts the following three-level severity rating scale to indicate how much help is needed: level 1, requiring support; level 2, requiring substantial support; and level 3, requiring very substantial support (Volkmar & McPartland, 2014). The inclusion of a severity rating metric can be useful for selecting the right intervention and studying the effect of treatments on a child's development over time (Lord & Bishop, 2015). However, some researchers argue that the effectiveness of severity indicators in practice is currently unknown, given that these indicators were not field-tested before the release of the DSM-5 (Lord & Bishop, 2015).

The DSM-5 team also investigated the age of onset or recognition of symptoms as a factor to be considered in the development of the diagnostic criteria for ASD. The DSM-IV required the presence of autistic disorder symptoms before age three (APA, 1994). However, the DSM-5 recognised that a child's racial or ethnic background, socioeconomic status, language and access to appropriate services, all influence the age at which ASD is initially diagnosed (Lord & Bishop, 2015). Numerous studies indicate, however, that it is highly uncommon to be able to pinpoint the exact onset date (Lord & Bishop, 2015). The DSM-5 notes that symptoms may appear in early life; however, three years is no longer used as an age threshold for eligibility for an ASD diagnosis (Esler & Ruble, 2015). This change was made in response to the realisation that some children might only be able to show noticeable symptoms once they reach a stage where social expectations exceed the skills they have already acquired (Esler & Ruble, 2015).

According to Lord and Bishop (2015), upon the release of the DSM-5, several researchers voiced concern about the way in which the manual grouped previously distinct categories into one spectrum. Some feared that the DSM-5 criteria would cause many individuals who had previously been diagnosed with PDD to lose their diagnosis. Others argued that the DSM-5 committee had intentionally introduced stricter criteria in response to the increasing prevalence of autism that was observed after the publication of DSM-IIIR and DSM-IV. However, Lord and Bishop (2015) emphasised that the primary aim of the DSM-5 "was to provide ASD criteria that as accurately as possible reflected behaviours that clinicians were using to diagnose ASD across the life span and across the full range of cognitive and language functioning" (p. 55).

The changes in thinking about autism diagnosis that have occurred since the publication of the DSM-III (APA, 1980) up to the present day have been characterised by intellectual debate and, sometimes, controversy. However, such debate is essential for

fostering the steady accumulation of evidence and the development of reliable and trustworthy diagnostic criteria.

2.2 Prevalence of Autism

Before the 1980s, autism was perceived as both a unique and extremely uncommon disorder (Happé & Frith, 2020). For example, early epidemiological studies estimated that the prevalence of autism was low, somewhere around 4 in 10,000 individuals (Lotter, 1966). The Diagnostic and Statistical Manual of Mental Disorders (DSM-III) (American Psychiatric Association [APA], 1980) came to a similar conclusion about the rarity of infantile autism, suggesting a prevalence of 2–4 cases per 10,000 individuals and suggesting that the disorder may be more prevalent in the upper classes (APA, 1980). These estimates were based on Kanner's diagnostic criteria for infantile autism (Gillberg & Wing, 1999). A number of epidemiological studies during the late 1970s and early 1980s challenged the view that autism was a condition that only affected a small fraction of the population. For example, Wing and Gould (1979) conducted an epidemiological investigation in a large area of London to estimate the number of children with autism under the age of 15. They found that the proportion of children with the triad of autism impairments (social, communication and imagination impairments) was around 21 per 10,000 children, which was nearly five times higher than the previously estimated prevalence. However, only 4.9 out of every 10,000 individuals met Kanner's diagnostic requirements.

Gillberg and Wing (1999) analysed all studies on the prevalence of autism published in English between 1966 and 1997 to see if an increase in the rate of autism had occurred over that period. They identified 20 studies that met their inclusion criteria; two of these had been conducted in the United States and the remainder in a range of countries, including Sweden, Japan, Scotland, and Indonesia. These studies were broken down by study year into four distinct periods, each spanning eight years. For the first two consecutive periods, from

1966 to 198, all non-US studies that fell into that timeframe reported prevalence rates of less than 0.5 and 4.4-4.9 per 10,000 individuals, respectively. The third cluster (1982-1989) contained seven research studies from a more diverse group of countries. The findings showed that the prevalence of autism varied widely by country, with a mean frequency of 7.7 per 10,000 cases. Furthermore, all eight studies published between 1990 and 1997 showed an increase in autism prevalence compared to earlier data. The overall prevalence rate throughout this period was 9.6 per 10,000 cases; a trend towards a higher incidence, occasionally exceeding 20 cases per 10,000, was observed across all examined studies. The two studies from the US, published in 1987 and 1989, indicated abnormally low rates. However, both studies had substantial sample sizes and satisfied the inclusion criteria. The US studies estimated a prevalence of autism of around 3.4 per 10,000 individuals, which was much higher than that reported in previous studies.

2.2.1 From Rare to Well Recognised

The number of individuals diagnosed with autism has continued to increase over time. Fombonne (2009) reviewed the findings of 43 studies, published between 1966 and 2008, which provided estimates for the prevalence of pervasive developmental disorders (PDDs), which include autistic disorder. He found that the typical estimation of prevalence was 6-7 per 1,000 individuals. This means that almost one out of every 150 children was diagnosed with PDD.

Neggers (2014) reviewed the results of autism prevalence studies released by the Centers for Disease Control and Prevention (CDC) between 2002 and 2008. Compared to data from earlier surveillance years, the findings from 2008 indicated a significant rise in the prevalence of autism. Comparison of the data from 2008 with that from 2002 indicated an increase of 78% in the prevalence rate, and an increase in the incidence rate from 1 in every 150 cases in 2002 to 1 in every 88 cases in 2008. Various studies have shown that the

prevalence of ASD in European and North American populations has undergone a comparable dramatic increase (Neggers, 2014; Waterhouse, 2012).

Epidemiologists have also sought to provide estimates of the global prevalence of autism. From an analysis of readily available data, Elsabbagh et al. (2012) estimated the average global prevalence of autism at 62 per 10,000 individuals. It is generally accepted that the current prevalence of autism may be as high as 1 in 100, with estimates varying widely depending on factors such as geography, ethnicity and socioeconomic status (Happé & Frith, 2020; Zeidan et al., 2022). However, some researchers question the credibility and value of these efforts to arrive at a global estimate of the prevalence of autism. Waterhouse (2012), for instance, notes that, because researchers have not yet been able to pinpoint a single, conclusive aetiology or combination of contributing variables, "only an international study assessing whole population groups of the same age range, using the same diagnostic measures conducted within the same period would provide a sound basis for determining world prevalence" (p. 348). In the absence of such evidence, debate around the global prevalence of autism is likely to continue.

Nonetheless, it is agreed that the prevalence estimates for autism have been steadily climbing to levels that are noticeably greater than those reported in earlier years (Prior, 2003; Zeidan et al., 2022).

2.2.2 Prevalence of Autism in Saudi Arabia

Epidemiological studies conducted in Saudi Arabia have reported a wide range of variability in autism prevalence (Yazbak, 2004). As discussed above, this inconsistency and lack of consensus are not unique to Saudi Arabia, but are part of a global phenomenon (Waterhouse, 2012). As in the rest of the world, however, the available evidence indicates a higher rate of autism diagnosis among males in Saudi Arabia (AlBatti et al., 2022; Alsulami et al., 2024).

Despite the likelihood that many cases of autism remain undiagnosed in Saudi Arabia, the reported prevalence rate has witnessed a dramatic increase (Alnemary et al., 2017; Sulaimani & Gut, 2019). For example, an early report indicated that only 42,500 cases of autism had been diagnosed in Saudi Arabia in 2002 (Yazbak, 2004). One frequently cited study reported an autism prevalence rate in Saudi Arabia of only one case per 167 individuals (Aljarallah et al., 2007). However, recent research has indicated a higher prevalence of autism in Saudi Arabia than the estimates presented in earlier studies. This wide variation is likely to reflect the absence of comprehensive national studies. Table 2.1 summarises the findings from the most important recent epidemiological studies conducted in Saudi Arabia.

Table 2.1

Recent Epidemiological Studies of Autism Prevalence in Saudi Arabia

Publication	**Study Design**	**Region**	**Setting**	**Prevalence**
Sabbagh et al. (2021)	Cross-sectional study	Two major cities (Makkah & Jeddah)	37 Rehabilitation centres and schools	2.618/1,000 children for Jeddah and 3.68/1,000 children for Makkah
AlBatti et al. (2022)	Cross-sectional study	Capital city (Riyadh)	Five hospitals	25 per 1,000 children aged 2–4 years, or 2.51%
Alsulami et al. (2024)	Systematic review and meta-analysis	Nationwide	Studies published from 2015 to 2023 that met the inclusion criteria	1.33% in Saudi Arabia compared to the global prevalence of 0.51%

2.2.3 Conceptualisation and Translation of Autism into Arabic

Since autism was first described in the United States, its definition and terminology were initially established by English-speaking researchers (Evans, 2013) and later introduced to non-English-speaking audiences. In most Arab countries, autism was not a subject of interest until the late 1990s (Hussein & Taha, 2013). The subsequent translation of the term into Arabic represented several linguistic adaptations of the original English word. Two terms commonly used to describe autism in Arabic are: *Al-Tawahhud*, which linguistically refers to unity and is derived from the concepts of oneness and solitude; and *Al-Thatawiyya*, which means self or self-centred and is considered a direct translation of the Greek word *autos* (Al-Zarrad, 2017; Qamish, 2011).

While *Al-Tawahhud* simply indicates withdrawing into oneself, the word is very similar to *Al-Tawhid*, which means divine unity. *Al-Tawahhud* can also be understood as referring to the state of loneliness or the desire for being alone, which is not a characteristic of autism. On the other hand, *Al-Thatawiyya* is considered to be a more technical term that more closely aligns with the nature of autism as understood in Western psychiatry (Al-Zarrad, 2017). However, *Al-Tawahhud* is far more commonly employed among Arab populations, including Saudis, despite the potential for semantic confusion (Al-Zarrad, 2017). It is important to note that *Al-Tawahhud* has come to replace older, stigmatising terms, such as imbecile or retarded, in line with recent shifts in Arab culture. *Al-Tawahhud* is the official term used in Saudi private and governmental organisations, especially in health and educational settings. Finally, several more positive and stigma-free terms for autism have recently emerged in the Arab world, such as ‘people of determination’ and other religiously-oriented expressions, such as *Nimah*, which means a gift from God (Olimat & Antwi-Boateng, 2024).

2.2.3 Factors Behind the Increased Prevalence of Autism

The most frequently proposed explanations for the increase in autism prevalence include: changes in diagnostic practice (Hansen et al., 2015; Matson & Kozlowski, 2011; Prior, 2003); increased community awareness and policy responses (Neggers, 2014; Wing & Potter, 2002); detection of autism in its earliest stages through the use of cutting-edge diagnostic tools (Matson & Kozlowski, 2011); the high survival rate of fragile and premature infants (Li, 2009; MSc et al., 1998); and the effects of exposure to toxic substances in the environment (Bolte et al., 2019; Hertz-Picciotto et al., 2018). In addition to these environmental and non-environmental factors, other probable contributory factors to the increase in prevalence include growing numbers of children born to elderly parents (Foldi et al., 2011; Wu et al., 2017); increased clinical focus on autism in females (Solmi et al., 2022); and the growth in rates of marriage among technical-minded individuals (Baron-Cohen, 2007).

It has been proposed that one of the main contributors to varying prevalence patterns over time has been changes in diagnostic criteria, which affected the number of people diagnosed with autism. Gillberg and Wing (1999), for example, argue that substantially lower prevalence rates result from the application of narrower criteria based on Kanner's descriptions rather than the criteria established in the later versions of the DSM. From their evaluation of research on autism prevalence published between 1966 and 1997, they conclude that the introduction of DSM-III and DSM-III-R criteria accounted for the most significant increase in autism prevalence in the subsequent two decades.

Nassar et al. (2009) conducted a similar examination of the potential impact of changing diagnostic criteria for autism in Australia over time. The study involved Australian-born children between the ages of 2 and 8 who had been diagnosed with autism. Findings showed that the prevalence of ASD rose from 8 cases per 10,000 births in 1983, to 46 cases

per 10,000 births in 1999, an annual increase of 11.9%. In the United States, King and Bearman (2009) examined the health records of 7,003 children with autism enrolled with the California Department of Developmental Services between 1992 and 2005. All these children were born before 1987. This study aimed, in part, to determine whether recent shifts in diagnostic criteria could be to blame for California's alarmingly high autism prevalence rate. Using the probability of change between those years, the authors suggested that approximately one-quarter of the increase in prevalence in California between 1992 and 2005 could be attributed directly to changes in the diagnostic criteria.

Inaccurate diagnosis, substitution diagnosis or broadening diagnostic criteria are all potential causes for the observed increase in the number of children diagnosed with autism (Waterhouse, 2012). Nevertheless, it is highly unlikely that changes in diagnostic criteria are the only factor accounting for this increase in the prevalence of autism. Other contributory factors include changes in legislation and increased awareness of autism. While undoubtedly important, debates over the cause/s and precise prevalence of autism potentially obscure the fact that the condition places a substantial burden on communities throughout the world, and there is an urgent need for practical actions to address its consequences. In this context, it is essential to recognise the spectrum of diagnostic signs of autism to ensure early detection and appropriate planning for the implementation of interventions (Salari et al., 2022).

2.2.4 Heterogeneity: The Core Challenge for Diagnosis and Intervention

The current dimensional approach to ASD focuses on the basic elements of the condition that can be identified in multiple contexts and which allow for variation in the quantity and quality of symptoms within and between affected individuals (Rosen et al., 2021). ASD can co-exist with other mental and behavioural disorders; in fact, individuals with ASD have a higher rate of comorbidity when compared with the general population (Ivanović, 2021). Recent research suggests that almost 70% of individuals with ASD will

experience one additional psychiatric disorder, while at least 40% will experience two or more during their lifetime (DeFilippis, 2018). The presence of other psychiatric disorders, such as attention deficit hyperactivity disorder, anxiety disorder or obsessive-compulsive disorder, has the potential to aggravate ASD symptoms and causes difficulties for diagnosis and treatment (Barlattani et al., 2023).

Autism was initially conceptualised as a unitary condition, and scientists actively sought to discover a single causative factor for the disorder (Happé & Frith, 2020). Even though individuals with ASD share a core set of symptoms, there is a great deal of clinical heterogeneity in relation to phenotypic presentation and symptom severity (Georgiades et al., 2013; Happé & Frith, 2020; Wiggins et al., 2022). Even the cases observed by Kanner exhibited a wide range of adaptive and intellectual functioning (Happé & Frith, 2020; Harris, 2018). The concept of phenotypic heterogeneity among individuals with autism has become more widely accepted over time (Lombardo et al., 2019). For example, the concept of social communication impairments in individuals with autism has become less rigid and more flexible and has changed from "extreme autistic aloneness" into a spectrum of symptoms that impact social behaviour (Lombardo et al., 2019).

Although formal diagnostic criteria are intended to provide a specific, limited definition of a disorder, those used to diagnose autism have always left room for variation (Waterhouse, 2012). For example, within the umbrella category of Pervasive Developmental Disorder in the DSM-IV (APA, 1994), new diagnostic categories in the form of subtypes were added to account for heterogeneity in early language and cognitive development. Although subtyping has been widely used in DSM publications, there are other methods for addressing the complexity of clinical variability. For example, the DSM-5 (APA, 2013) dimensional approach seeks to capture the commonality of core ASD symptoms with a goal of high specificity (Rosen et al., 2021). The DSM-5 allows for heterogeneity in the number

and nature of these symptoms, acknowledging the variety in symptom patterns, onset and manifestation associated with ASD (Rosen et al., 2021). In addition to recognising ASD as a behavioural diagnosis with many aetiologies, the DSM-5 specifiers and modifiers indicate the substantial variation within and between individuals with ASD (Lord & Bishop, 2015).

The heterogeneity of autism has been widely accepted within the academic community (Conti et al., 2022; Happé & Frith, 2020; Hobson & Petty, 2021; Zheng et al., 2020). Many experts have recommended a shift from the traditional standardised approach towards a deeper understanding of this heterogeneity (Lombardo et al., 2019). However, some scholars have questioned the validity of the construct of heterogeneity in the manifestation of autism. Mottron and Bzdok (2020), for instance, ask whether it is a fact or an artefact. They argue that the heterogeneity that supposedly characterises the autism spectrum has not been established through empirically or logically valid research, and is not a biological fact of nature. They propose that the dimensional approach of the DSM-5 criteria for autism involving open specifiers potentially yields a wide range of presentations. They recommend that further research be conducted on the phenomenon of *frank autism* or *classic autism* (de Marchena & Miller, 2017). This refers to a specific manifestation of autism that is instantly recognisable to experts upon interacting with an individual. The findings, they suggest, could provide a more accurate understanding of the essence of autism instead of relying on the broader concept of heterogeneous traits.

Hobson and Petty (2021) argue that the adoption of an understanding of classic autism as a unitary condition would not be advantageous for clinical practice and research, since such a narrow focus would fail to provide adequate empirical support for investigating the biological causes of autism. They articulate their position in relation to the ongoing debate around the best approach to the heterogeneity of autism as follows:

> We sympathise with the frustrations that come with the heterogeneity of autism and a desire to reduce the complexity surrounding its presentation and aetiologias. But we argue that we should not sacrifice validity for the sake of simplicity, particularly at the personal cost of many people who already face significant barriers to being diagnosed, nor should we assume that the field had autism right the first time: while a prototype is the original, it is also by definition preliminary (p. 3).

While it is expected that any mental condition would involve some degree of variability, the extent of heterogeneity in autism is far higher than that reported for other neurodevelopmental disorders (Waterhouse, 2012). Although autism researchers were slow to adopt the notion of a spectrum to describe autism heterogeneity, the idea that autism is a compound disorder was already well-established many decades before. Lorna Wing is generally credited with being the first to suggest the dimensional approach of the autistic spectrum, but the concept of heterogeneity had been around for some time (Happé & Frith, 2020). Despite recent advances, the heterogeneity of autism remains the primary diagnostic and treatment challenge for the disorder (Waterhouse, 2012). Research into the genetic origins of autism, diagnostic criteria and treatment options is still confronted by the substantial phenotypic heterogeneity of the autism condition (Georgiades et al., 2013).

In conclusion, research into heterogeneity has the potential to facilitate more accurate tailoring of interventions, methods of learning and treatment options (Lombardo et al., 2019; McIntyre et al., 2017). As Happé et al. (2006) have observed: “if different features of autism are caused by different genes, associated with different brain regions and related to different core cognitive impairments, it seems likely they will respond to different types of treatment” (p. 1220). Various research initiatives have sought to address heterogeneity in individuals with autism (Waterhouse, 2012), but our understanding remains limited (Conti et al., 2022).

2.3 Autism Education

Only limited research on the education and training of children with autism was published during the first three decades after Leo Kanner presented the initial clinical description of the condition (Thompson, 2013). In the 1960s, the influential psychologist, B.F. Skinner laid the foundation for the science of behaviourism, a theory of animal behaviour, which later asserts "that behaviourism was meant to be applied to all species, including human beings" (Axelrod et al., 2012, p. 1). Through extensive research and experimentation, Skinner made a significant contribution to behavioural science, which subsequently had a positive impact on individuals with autism (Thompson, 2013). Other key contributions are discussed below.

2.3.1 The Work of Lovaas and TEACCH Program

Lovaas was one of the first researchers to use Skinner's operant procedures to systematically provide intensive behavioural intervention for children with autism (Odom et al., 2021; Roane et al., 2016). Lovaas (1971) used the behavioural principle to teach children with autism (Odom et al., 2021), publishing several research studies during the 1970s in collaboration with colleagues, such as Robert Koegel, concerning autism learning style, adaptive skills and the fundamental nature of echolalia (Axelrod et al., 2012; Özerk et al., 2016; Smith & Eikeseth, 2011).

In a groundbreaking study, Lovaas (1987) applied behavioural analysis (ABA) approaches, such as discrete trial training, reinforcements, prompting, stimulus, and response generalisation, to teach a variety of social, language and adaptive skills (Axelrod et al., 2012; Reed et al., 2007). The children recruited to the treatment group were exposed to intensive ABA intervention using one-to-one teaching for a total of 40 hours a week over a period of three years (Reed et al., 2007). This study yielded historically significant results in relation to the effectiveness of intensive ABA intervention in helping children with autism to progress

(Axelrod et al., 2012). Lovaas reported that many of the children who participated in the programme increased their intelligence quotient (IQ) score by up to 30 points. In addition, they improved their adaptive and social skills and even started attending mainstream schools (Axelrod et al., 2012; Reed et al., 2007). In comparison, the control group, who attended the same treatments but for a shorter duration of around 10 hours a week, achieved significantly less progress (Reed et al., 2007).

The results of this study provoked heated discussion among researchers. Many of Lovass' advocates describe his work as having achieved an optimal outcome. Others, however, have criticised his methodological approach and rejected his proposal that these children had 'recovered' from autism. Critics have also questioned whether the intensity of the ABA programme on its own could account for the alteration in the dependent variables (Axelrod et al., 2012; Özerk et al., 2016; Smith & Eikeseth, 2011). Nonetheless, Lovaas's contributions encouraged other researchers to believe that the enhancement of children with autism's skills was attainable, and this in turn led to the development of several ABA treatment methods that have been described as "alternatives or adjuncts to the Lovaas model" (Roane et al., 2016, p. 28).

The TEACCH educational programme, led by Eric Schopler and his colleagues, is a teaching programme that arose early in the field of autism at the University of North Carolina in 1971 (Odom et al., 2021). Unlike Lovaas's teaching strategy, TEACCH adopts both cognitive-developmental and behavioural components (Lord et al., 2005). The TEACCH programme is underpinned by a philosophy referred to as a "culture of autism" in which great emphasis is placed on the child's unique strengths (Virues-Ortega et al., 2013). TEACCH involves both structured teaching and modification of the environment, with the aim of supporting the child's strengths while adapting the ecological variables to meet his or her neuropsychological needs (Mesibov & Shea, 2010). Schopler was one of the first experts to

reject Bettelheim's Freudian theory of the refrigerator mother and his recommendations for treatment. Instead, he emphasised the necessity for parents to be involved in all aspects of the interventions being deployed with their child. This is evident in the design of the programme, which conceptualises parents as the cornerstone of treatment planning and implementation (Odom et al., 2021; Ozonoff & Cathcart, 1998).

2.3.2 Strengths-Based Models

TEACCH is one of the early educational programs for students with autism that focus on students' strengths as a pathway for growth and overcoming challenges (Virues-Ortega et al., 2013). Strength-based learning is a philosophy that emphasises capabilities and talents as drivers of choices about teaching methods and interventions. Although the strength-based model does not ignore the challenges that students with autism face, it represents a preferred approach for effective skills acquisition and enhancement of motivation and self-esteem (Yin & Choy, 2024).

Individuals with autism can possess several distinctive cognitive abilities, including visual processing, structured thinking, excellent memory, and attention to detail and patterns (Rumsa et al., 2025; Xueyan, 2021). Numerous theories have been advanced to explain these unique capabilities. Baron-Cohen (2002) suggests that individuals with autism have a cognitive style that is strongly oriented towards analysing patterns and understanding and predicting systems. This explains why many students with autism perform better than others at predicting language structure, understanding number patterns, and working with computer coding. Another explanation is based on the idea of impacted central coherence, which suggests that, while many individuals with autism experience challenges in perceiving and processing the big picture, they are excellent at observing small details, detecting errors, and succeeding in activities requiring precision and consistency (Happé & Frith, 2006).

The strengths-based model has given rise to various recommendations for teaching practices that benefit students with autism. One of the main diagnostic characteristics of autism, and an area of strength, is obsessive interest in a specific subject or area of study (Lord & Bishop, 2015). Schools could take responsibility for building curriculum and educational goals that leverage these students' special interests. Similarly, teaching methods and EBPs that utilise visual aids and cues are considered powerful educational tools for students on the spectrum due to their superior visual processing abilities (Rumsa et al., 2025). Other characteristics, such as structured thinking and a preference for predictability, can be harnessed to improve learning by providing students with autism with a structured work system, routine, and clearly defined roles (Mesibov & Shea, 2010). The strength-based model must also incorporate appropriate modifications in assessment tools and the physical environment to address sensory needs and enhance learning engagement (Cherewick & Matergia, 2024; Rumsa et al., 2025).

It is important to note that the strength-based model aligns with and supports the contemporary neurodiversity approach, which views autism as a neurological *difference* rather than a deficit or disorder (White et al., 2025). The neurodiversity paradigm adopts a balanced stance which emphasises the dynamic relationship between the strengths and deficits associated with autism. According to Cherewick and Matergia (2024), failure to conceptualise autism in this way is a result of comparing the characteristics of individuals with autism to those of typically developing children. These authors argue that the neurodiversity framework and a focus on children's strengths have the potential to reduce stigma and promote social inclusion and respect. They conclude that the transition to a more positive interpretation of autism requires "a more holistic view of functioning that highlights how strengths can support functioning" (p. 409), and that intervention strategies should be modified to better align with the diverse needs of children with autism.

2.4 Evidence Based Practice in Autism Education

Various teaching practices can help children with autism achieve positive outcomes in their social, psychological, motor and academic performance (Wong et al., 2015). However, the wealth of autism educational research presents parents and educators with the challenge of identifying appropriate teaching practices. As Leaf et al. (2009) have commented, “in a field exploding with alternative treatments, choosing the best course of action for the child with autism can be a daunting task” (p. 1). In this context, one of the most important concepts is that of evidence-based practice (EBP).

Research into EBPs in the context of general and special education has benefitted from several international initiatives. In the United States, the No Child Left Behind Act (NCLB) of 2001 placed great emphasis on the use of only scientifically-based practices in the classroom to ensure that students achieve the best possible learning outcomes (Yell, 2012). According to Reichow et al. (2011), when the NCLB was enacted, school districts and related authorities progressively took responsibility for adopting EBPs in the classroom. The Teacher Training Agency in the United Kingdom has also played a key role in encouraging the use of EBPs. This agency works towards addressing the shortage of high-quality data in the educational field by encouraging teachers' participation in research (Hammersley, 2000).

Another early contribution was made by the Institute for Education Science (IES) in the United States, which sought to improve teachers’ ability to identify appropriate EBPs and employ them in the classroom. The IES created and funded the What Works Clearinghouse (WWC) to summarise education interventions that have been empirically proven to be effective educational research (Odom et al., 2010). While the WWC has achieved noticeable progress in identifying EPBs that are appropriate for the field of general education, some students with special needs, such as children with ASD, require more specific attention (Odom et al., 2010; Reichow et al., 2011). Overall, both general and special education fields

have been shown to confront the same challenge, namely, that ineffective practices are frequently utilised in the classroom despite the availability of scientifically-based educational techniques (Cook et al., 2013a).

Although a plethora of teaching and intervention practices have been categorised as EBPs in the literature, teachers may have neither the expertise nor the time needed to meticulously analyse dozens or hundreds of academic research papers in order to identify those teaching practices that are likely to be effective in their circumstances. As Wong et al. (2015) have pointed out, "it is impractical for professionals and practitioners to conduct a search of the literature whenever they are designing an intervention programme for a child or youth with ASD" (p. 1951). This problem has been addressed in various ways, as discussed below.

2.4.1 The First NRC Report and its Limitations

In response to a request from the US Department of Education, the National Research Council (National Research Council [NRC], 2001) published one of the earliest and most influential reports identifying effective early interventions for young children with autism (Reichow et al., 2011). In this report, the committee describes ten package interventions, that is, comprehensive programmes that are based on empirical evidence of the outcomes of early autism educational interventions (NRC, 2001; Odom et al., 2021; Reichow et al., 2011). These interventions are classified under six core target areas of behavioural and developmental needs among children with autism, including adaptive and behavioural difficulties, and social, communicative, cognitive, sensory and motor development (NRC, 2001). The report specifically identifies several programmes that are backed by empirical scientific data demonstrating their effectiveness in helping young children with autism (Reichow et al., 2011). These include, but are not limited to, the UCLA autism programme established by Lovaas and his colleagues, the TEACCH programme, and the Early Start

Denver Model (NRC, 2001). The NRC committee asserted that the success of these intervention programmes is contingent upon adherence to several recommendations. One of the most important of these is the need to enrol young children with autism as early as possible, immediately following diagnosis (NRC, 2001).

In relation to policy and legal considerations, the committee discusses the significance of establishing a well-designed Individualised Educational Programme (IEP) and developing teaching strategies to address the IEP objectives for a successful outcome (NRC, 2001). Additionally, on a number of occasions, including in a separate chapter titled *The Family Role*, the committee highlights the necessity for the active participation of the family in the IEP interdisciplinary team (NRC, 2001). Another recommendation was that young children with autism should engage in an intensive intervention programme for 25 hours per week throughout the year. As well as providing suggestions for the selection and implementation of educational programmes, the NRC report also reviewed a wide range of related themes such as the characteristics of autism, and issues around diagnosis, prevalence, assessment and legal policies (NRC, 2001).

However, the NRC report had many limitations. Reichow et al. (2011) identified numerous weaknesses in its design and conceptual framework and the narrowness of its scope. To begin with, the selection or inclusion of a particular intervention programme was based mainly on peer-reviewed papers, the general focus of intervention programmes, and federal financial support. Although the use of these inclusion criteria was helpful, they argued that the NRC report had a limited focus on a specific academic context, to the neglect of other perspectives. The exclusion of innovations from outside the United States and those without access to university resources or governmental funds resulted in an exploration of a narrow, less diverse range of autism interventions. In addition, although some of the intervention programmes nominated by the NRC team were based on extensive peer-reviewed

publications, others were at an early stage of research advancement and had few peer-reviewed publications to support them.

According to Reichow et al. (2011), the NRC committee may have unintentionally overlooked particularly critical issues. They identified the following shortcomings:

- no formulation of systematic methods to assess and score each intervention programme;
- limited attention directed toward obstacles impacting treatment effectiveness;
- no reference to related terminologies, such as EBP, evidence-based treatment (EBT) and evidence-based medicine (EBM), or current discussions around these concepts; and
- no consideration was given to intervention programmes that are suitable for older school-aged children and adults with autism.

However, the report produced by the NRC committee represented an early and novel attempt to comprehensively examine effective intervention programmes to enhance multiple aspects of the developmental needs of young children with autism. At the same time, the identification of gaps in its coverage provided a foundation for the design of subsequent educational research on autism.

2.4.2 Identifying EBPs for Specific Skills

Simpson et al. (2005) conducted a comprehensive examination of 33 interventions or treatments frequently used in the field of autism to assess their applicability and effectiveness. The authors assert that there was a need to distinguish between scientifically based interventions and those with limited or no supporting evidence. Additionally, this review could help parents and teachers who may face significant challenges in selecting an appropriate intervention. The authors argue that no teaching method can be recognised as a universally accepted intervention to improve individuals with autism. Instead, this review

attempts to identify the most beneficial interventions with maximum research support and to "be made available in straightforward and simplified form" (p. 8).

In their review, Simpson et al. (2005) presented interventions or treatments under the following four distinct hierarchical categories. The highest level is the *Scientifically Based Practices category*. Interventions listed under this category are defined as "those that have significant and convincing empirical efficacy and support" (p. 9). In other words, they have been examined in many research studies and have repeatedly produced positive outcomes in achieving target behaviours. Only four of the 33 interventions were rated as Scientifically Based Practices. They were primarily Applied Behaviour Analysis (ABA) interventions, such as discrete trial training (DTT), which had previously been recommended in the NRC report as part of the UCLA programmes. ABA techniques continue to hold the greatest promise as an approach to teaching children with autism a variety of social, academic and adaptive skills (Cividini-Motta et al., 2023) and are regarded as a very effective practice in many recent reviews of EBPs (Hume et al., 2021; Steinbrenner et al., 2020; Wong et al., 2015).

The *Promising Practices* category is defined as those interventions that demonstrate "efficacy and utility with individuals with ASD, even though the intervention requires additional scientific support to be considered a scientifically based method" (p. 9). Thirteen interventions are reported under this category, distributed across four treatment types or focuses (interpersonal relationships, skill-based, cognitive, biological, and neurological treatments). As the results of various research studies accumulated, most of these interventions, including Assistive Technology, Augmentative and Alternative Communication, Cognitive Behavioural Modification, and Picture Exchange Communication Systems, underwent development and are currently classified as EBPs (Hume et al., 2021).

Practices with Limited Support have been exposed to little research, have yet to be widely implemented, and have produced mixed outcomes. This category includes many

supplements and diet-based treatments. Gentle Touching and Animal Therapy were included as interventions targeting interpersonal relationship skills that had limited support.

The *Not Recommended* category refers to interventions or treatments that have been confirmed by research to be ineffective when implemented for individuals diagnosed with autism, and may even have harmful consequences. Some of the interventions under this category, such as Holding Therapy and Facilitated Communication, continue to lack evidence of effectiveness almost two decades after the publication of this review (Odom et al., 2021; Steinbrenner et al., 2020).

2.4.3 The NRC Report and Simpson's Review: A Comparison

The main distinguishing feature of the review by Simpson et al. (2005) is that it developed four categories of interventions and ranked them hierarchically, from those with the greatest amount of supportive research evidence to those that should not be employed in teaching individuals with autism. This hierarchical arrangement has several benefits. First, it alerts parents and educators to practices that need to be avoided (i.e. the *Not Recommended* category), and also helps to guide researchers in identifying interventions that warrant further investigation (*Promising Practices*). Furthermore, drug treatment was briefly mentioned in the report issued by the NRC committee (Reichow et al., 2011). However, Simpson's group provided detailed discussions of biological treatments, diet, and the use of supplements (NRC, 2001).

In summary, these research groups are to be commended for their innovative efforts to identify and evaluate various autism educational interventions. However, the methodologies adopted in these reviews to select and assess interventions raise questions about the quality of their findings. As Wong et al. (2014) have commented: "although these reviews were systematic and useful, they did not follow a stringent review process that incorporated clear

criteria for including or excluding studies for the reviews or organising the information into sets of practices" (p. 4).

2.4.4 Toward a Systematic Approach for Identifying EBPs

Seeking more reliable results for the evaluation of EBPs, Odom et al. (2003) provide more precise methods for including and excluding criteria to identify autism teaching practices. Odom et al. (2003) reviewed related publications from 1990 to 2002, and only 37 studies met their inclusion criteria. All the studies examined had been published in peer-reviewed journals, yet they only utilised a single-subject design (SDD). Odom et al. (2003) established several additional inclusion criteria, namely: the results must demonstrate a causal relationship between the independent variable and the target behaviour, and the research sample must contain, at a minimum, 50% of children diagnosed with autism and the same percentage aged younger than six years. The studies that met these criteria were later subjected to a methodical coding procedure to identify the features and quality of the implementation of the SSD design.

This coding procedure involved asking a variety of questions, such as what type of single-subject design (e.g., multiple-baseline, withdrawal or reversal) was employed; where was the research conducted and who conducted it; was the study replicated; how many times was the independent variable effect observed; and what were the characteristics of both the dependent and independent variables (Odom et al., 2003). The authors developed a rating system to evaluate quality-related factors, analyse the occurrence of generalisation and maintenance phases, examine the social validity of treatment outcomes, and assess the independent variable and fidelity of intervention. The results of this analysis indicated that 67% of the 25 nominated research studies used a multiple-baseline design, while 13 other studies employed another SSD design. Almost one-third of the included studies reported measuring maintenance, while 41% reported assessing generalisation for the acquired skill.

Finally, of the total number of participants (105) recruited in these research studies, the average age was four years and eight months, with boys representing at least three-quarters of the participants.

From further analysis of the included studies, Odom et al. (2003) identified three categories of intervention practices, classified according to the level of evidence as originally proposed by Lonigan et al. (1998) but modified to include a third, middle level of evidence. Lonigan et al. (1998) used the term *well-established* to refer to interventions supported by more than nine studies, while the category *probably efficacious* included interventions supported by at least three research studies. However, Odom's research team encountered a problem: "Several practices were in the evidentiary midrange between these two descriptors, in that they were supported by at least six single-subject design studies" (Odom et al., 2003, p. 172).

Odom et al. (2003) classified adult prompting or adult-directed teaching as a *well-established* intervention, with 13 research studies supporting its use with children with autism. This was followed by differential reinforcement, with 11 research studies supporting it. The reviewers noted that these two interventions represented the traditional methods of behavioural treatment established by pioneers in applied behaviour analysis. The second level of evidence, *emerging and effective,* comprised four types of interventions: "peer-mediated interventions, visual supports, self-monitoring, and family member involvement in the intervention" (Odom et al., 2003, p. 166). Finally, video recording, incorporating children's preferred choices in educational tasks, and positive behaviour support were rated as *probably efficacious interventions.* However, the reviewers argued that these interventions, regardless of their limited research support, could be valuable additions to practice and held out promise for autism education.

In conclusion, this early research review made a significant contribution. However, it had several limitations. Although the reviewers considered participants' demographic information as a vital factor in evaluating the efficacy of EBPs, and discussed it extensively, they paid almost no attention to sociocultural factors and ethnic background. Despite these limitations, the study by Odom et al. (2003) made a significant contribution to methodological diversity by recognising SSD as a scientifically valid experimental design for research on EBPs, despite the objections of many prominent scholars who argued that only randomised control-group designs should be used in research to identify EBPs.

2.4.5 The Role of Single-Subject Research Designs (SSD) in Identifying EBPs

This is the context in which the debate around the appropriateness (or otherwise) of SSD as a research method for investigating the functional relationship between variables while maintaining experimental control. Although several researchers, especially in the early and mid-2000s, were questioning and even doubting the validity and utility of SSD to define EBPs (Shavelson & Towne, 2002 as cited in Odom et al., 2003), others argued that SSD was exceptionally well-suited to assessing educational practices in the field of autism because of its rigorous method and individual-centred approach (Horner et al., 2005; Odom et al., 2003; Reichow et al., 2008; Tankersley et al., 2008).

SSD has been described as "a methodological approach that can be used to investigate the effectiveness of treatment with the individual client" (Kazdin, 2019, p. 3). Use of the term 'single subject' might have caused the misconception that the design only dealt with one case; however, a group of individuals can be involved (Kazdin, 2019). Another concern about the validity of the SSD method is the absence of an experimental control group. Unlike in randomised controlled trials, the participants in a study employing SSD serve as their own controls, and comparison is used to investigate behavioural change, if any, before and after the introduction of the independent variable (Horner et al., 2005; Vannest & Ninci, 2015). To

clarify, in a group research design, participants are randomly assigned to two or more groups, at least one of which receives the intervention, with the control group receiving no intervention. In group research design, the functional relationship or internal validity is examined for all participants before and after treatment (Kazdin, 2019). In SSD, internal validity is established through repeated measures of the dependent variable over time and across baseline, intervention and maintenance phases. As Kazdin (2019) explains, “both design strategies require making comparisons of performance under different conditions, and both can draw causal inferences about the effects of interventions” (p. 4).

Horner et al. (2005) discuss a range of measures that can be deployed to improve the implementation of SSD. First, since the participants serve as the unit of analysis, the researcher must provide a clear description of the recruited cases (e.g., type of diagnosis, age, gender, current level of performance, social and economic status), timeframe, location and any other relevant circumstances, the process of intervention, and the methods of data collection and observation. In other words, a functional relationship between the independent and dependent variables can only be confirmed and generalised if comparable findings of larger populations are obtained through replication (Kazdin, 2019). Horner et al. (2005) emphasise the importance of operationally defining and constantly measuring the dependent variable. Having an operational definition allows others to replicate the study by carefully observing the same target behaviour within each observation session, which can enhance the level of interobserver agreement.

Horner et al. (2005) also offer suggestions in relation to the use of operational definitions for independent variables to ensure replicability and enhance the interpretation of findings. In this context, they emphasise the selection of a dependent variable that is socially important: “A dependent variable is chosen not only because it may allow assessment of a conceptual theory, but also because it is perceived as important for the individual participant,

those who come in contact with the individual, or for society" (p. 167). They also highlight the application and reporting of treatment fidelity. Treatment fidelity means that the intervention is implemented as intended, with the highest level of adherence to the planned procedures. This enables easy replication and ensures that behavioural changes are directly attributable to the independent variable (Kazdin, 2019).

Horner et al. (2005) discuss the crucial role of the core components of SSD in achieving validity and reliability of the study. These core components serve as guides to facilitate the assessment procedures in SSD and ensure the accuracy of the collected data. They propose a quality indicator for SSD research to determine if a particular study meets the threshold standard and if the obtained findings are statistically significant. The quality indicator contains 22 themes distributed unequally on seven primary focuses (internal and external validity, dependent and independent variables, baseline measure, social validity, and description of participants and settings). The quality indicator items were formulated to generate a detailed account of the procedures deployed in a study using SSD. For example, for participants and settings, three themes are to be assessed: "(1) Participants are described with sufficient detail to allow others to select individuals with similar characteristics (e.g., age, gender, disability, diagnosis); (2) The process for selecting participants is described with replicable precision, (3) Critical features of the physical setting are described with sufficient precision to allow replication" (p. 174). Horner et al. (2005) also present several arguments to support their position on the suitability of SSD for determining EBPs in the field of special education. They point out that special education is a problem-solving discipline; thus, active and continuing research intervention, which SSD may provide, is essential. Additionally, while a group of individuals is often the target for many disciplines, special education treats everyone as a unique entity; as a result, he or she represents the central focus. In comparison with the general population, people who express heterogeneous traits are relatively rare, and

SSD can be used to address their wide-ranging needs through individually tailored interventions. Further arguments in favour of SSD include its cost-effectiveness, time efficiency and flexibility (Horner et al., 2005).

The use of SSD in autism research offers many benefits because its robustness allows for the identification of related EBPs (Hora & Sella, 2022) and it is suitable for examining the diverse and unique features of special education settings (Zanuttini, 2020). However, every research method has its strengths and weaknesses. External validity in SSD was, and continues to be, the greatest threat to the generated findings (Alnahdi, 2015). While many researchers advocate for research replication to enhance generalisability, others question whether replication efforts can enhance methodological quality (Alnahdi, 2015). Moreover, SSD employs visual analysis measures to inspect the change in dependent variables across conditions (Kazdin, 2019). Even though valuable insight can be obtained using visual analysis (Vannest & Ninci, 2015), this method, which depends on human judgment, may lack statistical significance and be prone to subjectivity and potential bias (Engel & Schutt, 2009).

In summary, the use of SSD in special education research, particularly in autism studies to identify EBPs, is supported by a series of early research studies (Horner et al., 2005; Odom et al., 2003; Reichow et al., 2008; Tankersley et al., 2008). While this position is well justified, there is an emerging trend towards the use of multiple research methods in the special education field.

2.4.6 The Utility of Multiple Research Methods for Identifying EBPs

Referring to the work of a Task Force established by the Council for Exceptional Children in 2003, they identify four research methods that can be used to advantage in special education: experimental group design; single-subject design; qualitative research; and correlational studies (Odom et al., 2005). Because the field involves complex and multifaceted issues, there is a need for a range of research methods. The Task Force provided

quality indicators for each method to ensure the rigour and validity of the research, and explained the particular contribution of each method to the goal of identifying effective practices in special education.

Reichow et al. (2008) argue that educational research on autism has lacked the appropriate methods to identify and assess high-quality research evidence. They propose using the *Evaluative Method for Determining EBP in Autism*. This method incorporates criteria for assessing the strengths of EBPs research reports and rubrics to evaluate their accuracy. The authors recommend using two-level methodological rubrics as primary and secondary quality indicators. The primary quality indicator emphasises the component relevant to research validity, while the secondary indicator focuses on other critical aspects of quality research. However, it does not necessarily correlate to research validity. To illustrate, items included in the primary quality indicators for group design and SSD may contain information on both dependent and independent variables as well as participants' characteristics. The secondary quality indicators, however, include the assessment of, for example, treatment fidelity, social validity, and interobserver agreement. These quality indicators are operationally defined and assessed based on two distinct grading scales high, acceptable, and unacceptable quality for the primary indicators, and evidence or no evidence for the secondary indicators.

Reichow et al. (2008) also provide guidelines for assessing the strength of research reports using data derived from the prior quality indicators. The strengths of the report are divided into three categories: strong, adequate and weak. For example, for a group research design to be considered strong, all primary quality indicators and at least four components of the secondary quality indicators must be met. For SSD research, however, there must be evidence of all primary quality indicators and at least three of the relevant secondary quality indicators (Reichow et al., 2008). The guidelines also establish specific criteria for adequate

and weak research: “adequate research report strength designates research reports showing robust evidence in most, but not all areas. Weak research report strength indicates the research report has many missing elements, and/or fatal flaws” (Reichow et al., 2008, p. 1313).

The third instrument proposed by Reichow and his associates relates to the classification of various educational practices identified in research into categories in order to reach an overall assessment. Two criteria for identifying EBPs are inspired by guidelines commonly employed in the social science field. Table 2.2 summarises these authors’ classification of established and promising EBPs and how they meet the inclusion criteria.

Table 2.2

Descriptive Standards for Treatments Classified as EBP

Level of Evidence	**Description and Criteria**			
	Type of Design	Number of Studies	Report Strength	Minimum Requirements
Established EBP	SSD	5	Strong	3 different research teams 3 different locations 15 different participants
	SSD	10	Adequate	3 different research teams 3 different locations 30 different participants
	Group experimental design	2	Strong	Separate research teams and laboratories
	Group experimental design	4	Adequate	2 Separate research teams 2 different laboratories

	Group design and SSD	1 and 3	Strong for both	No additional requirements
	Group design and SSD	2 and 3	Adequate for the group design & Strong for the SSD	No additional requirements
	Group design and SSD	1 and 6	Strong for the group design & Adequate for the SSD	No additional requirements
	Group design and SSD	2 and 6	Adequate for both	No additional requirements
Promising EBP	SSD	3	Adequate	2 different research teams 2 separate locations 9 different participants
	Group experimental design	2	Adequate	No additional requirements

Source: Reichow et al. (2008).

In establishing these criteria, the authors were among the first scholars in the field to elaborate multilevel operationalised methods for determining EBPs with the aim of addressing the research-to-practice gap. Mesibov and Shea (2011) have described the three-step evaluation approach proposed by Reichow et al. (2008) as "more flexible than the Division 12 criteria and more practical than the APA criteria and appears to have promise for the field of autism intervention research" (p. 115). The following section sheds light on the noteworthy progress made in the last 15 years by various research authorities using more

highly developed assessment methods for identifying and reporting EBPs in autism education.

2.4.7 The NAC Project

As a way of addressing the many limitations of the existing EBPs reports, in 2009, the National Autism Center (NAC) published the first phase of the National Standards Project, which reviewed the literature on autism educational and behavioural interventions (National Autism Center [NAC], 2009). With an emphasis on both comprehensive and focused interventions, the NAC analysed 775 peer-reviewed publications from the 1960s to 2007, making it one of the largest reviews of EBPs in autism education. The NAC team followed a standard assessment process to evaluate the selected studies. The team initially selected a group of experts to participate in the evaluation process and subsequently trained them to utilise the grading system. These experts independently evaluated both group research design and SSD studies based on standardised criteria. The strength of the research evidence was assessed based on the obtained score to classify each treatment under one of three categories (Wong et al., 2014).

The report identified 11 practices classified as established, 22 practices identified as emerging treatments, and only five unestablished treatments (NAC, 2009). Established treatments were defined as interventions that have produced positive outcomes for individuals with autism. Emerging treatments referred to practices with evidence of effectiveness but requiring more research to draw a conclusion about their quality and utility. The unestablished category comprised interventions that needed more reliable and robust evidence but which, in the absence of empirical evidence, could not conclusively be described as harmful or ineffective (NAC, 2009).

2.4.8 The 2010 NPDC Report

While the NAC report discussed the significance of distinguishing between comprehensive treatments and focused interventions and included both types of treatment, others, such as the National Professional Development Center (NPDC), only reviewed focused interventions (Odom et al., 2010). Even though the NPDC report did not include comprehensive treatments, the team stressed the importance of providing sufficient detailed information about the components of the comprehensive treatments to allow for replication (Odom et al., 2010). The NPDC report was released about a year after the NAC report, and while both were conducted in the United States, they were conducted independently by different research teams.

The NPDC team reviewed research evidence from studies published between 1997 and 2007 (Odom et al., 2010). They developed five main criteria for research studies to be accepted in the EBPs identification review. The selected research study must first be conducted on participants who received a diagnosis of autism and were aged between birth and 22 years old. Additionally, the observed improvements must be attributed directly to the independent variable with a demonstration of strong experimental control that limits the threat of internal validity (Odom et al., 2010). The initial stage of the review resulted in 175 publications being included in the report. The next step was to identify the specific criteria that the focused intervention must meet to be classified as EBP. These criteria are summarised in Table 2.3

Table 2.3

Criteria for Identifying EBP in the NPDC Report (Odom et al., 2010)

Level of Evidence	Type of Research Design	Minimum Criteria
EBP	Experimental or Quasi-experimental group design	Two peer-reviewed studies that satisfy the requirement of standard methodology and are carried out by different research groups.
	SSD	Five peer-reviewed studies that satisfy the requirement of standard methodology and are carried out by three different research groups.
	Combined design	One experimental or quasi-experimental and three SSD that satisfy the requirement of standard methodology and are carried out by different research groups.

In this report, Odom et al. (2010) identified 24 EBPs that can be used with toddlers, school-aged children, and youth with ASD. These were grouped into two categories. The first category comprised behavioural teaching practices based on the principles of ABA, many of which were data-driven and widely recognised as capable of improving the core symptoms of individuals with autism. They include reinforcement, prompting, DTT, PRT, time delay, response interruption and redirection, and differential reinforcement. The NPDC team argued that, even though some of the identified EBPs appeared as part of other interventions (e.g. prompting and reinforcement are a part of DTT), a substantial body of literature supports their being listed separately. The second category was positive behaviour support, which

includes teaching practices that are utilised to reduce undesired behaviours such as off-task, repetitive, and self-injury behaviours (Odom et al., 2010).

The NPDC report also discussed a number of key issues relevant to the appropriate use of EBPs, the selection of EBPs, and methods of disseminating knowledge of EBPs. An outcomes matrix was provided to demonstrate how each focused intervention was beneficial for teaching specific skills or was linked to certain educational domains. For instance, the use of reinforcement, which falls under the category of behavioural interventions, was said to be applicable to specific learner outcomes, including academic, behavioural, communication, and play skills.

Before teachers use the proposed matrix, they are advised to determine the learner's current level of performance and identify learning objectives based on their needs. Odom et al. (2010) noted that much of the published work on EBPs in autism education already contained information about effective teaching practices. However, they felt it necessary to provide instructions for their successful application in natural settings. Therefore, they provided a step-by-step guide and multiple checklists to facilitate the integration of EBPs in practice. A free online platform containing videos, images and case studies was also established to enhance the implementation of EBPs and data collection procedures.

Although different research teams conducted the NPDC and NAC reviews and covered different time spans and durations, the overall findings were remarkably similar (Wong et al., 2014). The NAC report identified eleven interventions as established practices, while the NPDC identified more than twice as many. This disparity, however, can be attributed to differences in how teaching practices were categorised. The NAC report examined many comprehensive treatments that might contain a bundle of focused interventions; for example, the antecedent package reported by the NAC team contained three

of the NPDC's focused interventions (prompting, time delay, and antecedent-based intervention) (Wong et al., 2014).

The NPDC included six focused interventions in the EBPs group that were not mentioned in the established treatments of the NAC report. However, only five were classified by the NAC as emerging interventions (Wong et al., 2014). A key distinction between the two reports revolves around the inclusion of the joint attention intervention. While the NAC team identified joint attention as a separate, established treatment, the NPDC team perceived it as a learning outcome (Wong et al., 2014). In conclusion, both reports successfully employed sophisticated, scientifically based methodologies to evaluate autism educational practices.

2.4.9 The Second-Generation NPDC Review

As more research was conducted, there was a need to identify and evaluate emerging evidence on autism teaching practices (Odom et al., 2010). Accordingly, the NPDC conducted a second phase review to revise the previous report and extend its scope (Wong et al., 2014). The NPDC team gave a number of reasons for doing this. First, many reports relating to focused interventions had been published since 2010 and were therefore not included in the earlier review. The time-related inclusion criterion was therefore modified to incorporate research studies published between 1990 and 2011(a time span of approximately 20 years). Second, there was a need to update the evaluation process that had previously been used to identify EBPs. This involved the development of new assessment procedures: instead of relying solely on the NPDC team to evaluate published research studies, the task was outsourced to a group of experts from various institutions across the United States. As a result, the second phase of the NPDC review was described as comprising "a new and expanded database of articles, a new evaluation process, and new or modified focused intervention categories" (Wong et al., 2014, p. 7).

Only peer-reviewed articles published between 1990 and 2011 were included in the second phase of the NPDC review. Participants in these studies must have been diagnosed with ASD and aged from birth to 22 years. Studies whose participants suffered from co-occurring conditions, such as intellectual disability, genetic disorder or mental illness, were eligible for inclusion. The criteria further specified that research studies should include developmental, behavioural and/or educational factors as independent variables. The use of medication, supplements or a dietary programme as an intervention was sufficient reason to exclude the study. Studies also had to demonstrate experimental accuracy and involve a comparison between treatment conditions and no treatment conditions. Finally, only studies that aimed to examine the efficacy of a focused intervention using experimental group design, quasi-experimental design, or SSD were included.

The NPDC employed a review protocol based on previously published quality indicators that had been developed to investigate SSD (Horner et al., 2005) and group design studies (Gersten et al., 2005), along with the recent review guidelines from Wong et al., 2014. The initial search of the database identified 29,106 articles related to ASD interventions. After several rounds of screening, the number of potentially acceptable articles was reduced to around 1,000 (Wong et al., 2014). The NPDC team then employed 159 external reviewers who received training to ensure consistency in evaluations. Each received an average of eight to nine articles to review using the study's quality indicators. After additional screening and evaluation, only 456 of the initial 29,106 articles met the inclusion criteria. The final stage of the review involved determining if a teaching practice could be classified as an EBP based on previously identified criteria. For a focused intervention to be considered an EBP, it should meet the following criteria:

- A minimum of two studies conducted by different investigators utilising an experimental or quasi-experimental group design.

- At least five studies using SSD and carried out by a minimum of three researchers or research groups who were working independently.
- A minimum of three SSD studies and two experimental or quasi-experimental group design studies conducted by two or more different research groups.

At first glance, these criteria might appear identical to those adopted in the first NPDC review (Wong et al., 2014). However, there was one difference: the second review specified at least two group design studies instead of one for the combined category.

The report of the second review provided important information of various kinds on key elements of each study, such as the type of research design used in the final review stage, the characteristics of study participants, outcomes, and practices that met the inclusion criteria. The individuals who had been recruited to participate in the studies included in the review had all been diagnosed with autism. However, they were sometimes described by other related terms, such as Asperger, PDD and ASD (Wong et al., 2014). Although the NPDC team had aimed to identify EBPs for children, youth and young adults with autism, the participants in the studies included in the review were children aged 3- 11 years, while the number of participants older than 12 represented a tiny fraction.

The systematic review identified 27 focused practices that met the EBP criteria. All focused practices, especially the behaviourally-based interventions mentioned in the first NPDC report (Odom et al., 2010), were incorporated in the second review. However, some alterations were made to include new focused practices and exclude or regroup others. One focused practice, the structured work system, was removed from the second review because it did not meet the new stricter inclusion criteria. Additionally, both computer-aided instruction and speech-generating devices (two focused practices listed in the first NPDC report) were incorporated under the technology-aided instruction package. Based on recently available research evidence, the second NPDC report also identified five additional focused

interventions (modelling, exercise, scripting, structured play group, and cognitive behaviour intervention) as having acquired sufficient evidence to be classified as EBPs.

The NPDC team also introduced a new category, "other practices with empirical support", to include focused interventions that had some empirical evidence but not enough for them to be classified as an EBP. Several focused interventions were listed in this category, including but not limited to cooperative learning, exposure, direct instruction, music therapy and independent work system. These focused interventions were not identified as EBPs because they failed to meet the required methodological standard. Most of the interventions in this category lacked sufficient high-quality studies supporting their efficacy. Others had sufficient supported evidence, but either the research had been conducted by a single team, or the total number of participants did not meet the inclusion criteria.

Overall, the NPDC report presented a comprehensive review of EBPs and promoted the use of a data-driven approach to bridge the research-to-practice gap in autism education literature by assisting parents and educators to make informed decisions about intervention choices. The report itself has a user-friendly design that incorporates visual elements, actionable recommendations, and fact sheets for every EBP containing a detailed description of the focused intervention, potential outcomes and recommended age group, among other information.

The NPDC team had been motivated to include a wider age group than previous studies (NRC, 2001; Odom et al., 2003), which failed to report EBPs for older individuals with ASD. However, the failure to conduct subgroup analysis could lead to bias and limit the generalisability of the results on EBPs to participants above the age of 12. It is also worth noting that, although the final stage of the review included 456 articles that reported results from both group and SSD studies, the group design studies represented a tiny proportion, only 10% of all studies.

2.4.10 The Second-Generation NAC Review

Like the NPDC, the NAC team also revised their first report on ASD interventions (National Autism Center [NAC], 2015). The second review had the same aim as the first, that is, to provide the most up-to-date information on high-quality ASD interventions based on research studies published between 2007 and 2012. The second-generation review, however, extended the age range of participants to include older individuals with autism in recognition of the paucity of available research addressing interventions for this population. Accordingly, the scope of the review was expanded to include all available studies that addressed adult interventions from previous decades (NAC, 2015).

The expert panel also recommended a change in terminology. Whereas the first report had used the terms treatment or strategy throughout the review to describe teaching practices used with ASD individuals, the second review adopted the term intervention. Although the NAC team was aware that the majority of other researchers in the field used the term EBP, they argued that the term evidence-based intervention was more accurate because EBP encompasses a wider range of multilayer processes (NAC, 2015).

In addition to updating the original findings, the second NAC report identified other critical factors that influence EBP, such as professional expertise, knowledge, implementation processes, and the values and preferences of individuals with autism and their families. The NAC team employed three unique tools developed by the expert panel to provide a rigorous evaluation of research evidence and ensure transparency in relation to the conduct of the study and its effect on participants. Using the same three categories as in the previous report, the team classified 14 interventions as EBPs, 18 as emerging interventions, and 13 as unestablished. Surprisingly, despite an extensive review of all available literature on adult interventions, only 27 studies met the inclusion criteria. Further analysis of these 27 studies identified only one intervention classified as established and one as emerging. The

report concluded that the shortage of research on interventions relevant to this population explained the inadequacy of the available guidelines and support for adults with ASD.

2.4.11 The Third-Generation NCAEP Review

Building on the second-generation NPDC review (Wong et al., 2014), the National Clearinghouse for Autism Evidence and Practice (NCAEP) disseminated a third-generation systematic review of EBPs, which reported new evidence from the literature. This review was motivated by the dramatic increase in research on autism interventions that had taken place between 2012 and 2017. As the authors remarked, "such an active literature requires ongoing surveillance and evaluation to keep up with the research documenting possible new EBPs and continuing to validate existing EBPs" (Steinbrenner et al., 2020, p. 14). This systematic review included research articles published between 1990 and 2017, an increase of five years, compared to the previous review by the NPDC team. This third-generation review identified 567 studies that met the inclusion criteria; these were then combined with the 972 articles previously identified by the NPDC team for analysis (Hume et al., 2021).

The NCAEP review was conducted in five phases: initial searching and screening for potential research articles, followed by more complex procedures, including quality appraisal, data extraction and synthesis (Hume et al., 2021). Several rigorous procedures were undertaken in these five phases, including selecting and training qualified reviewers, determining appropriate databases and screening research articles to evaluate the various elements (e.g., intervention-focused, outcomes, study design and target population). The review employed similar criteria for the identification of EBPs as those used by the second-generation NPDC review (Steinbrenner et al., 2020).

Table 2.4 compares the second-generation NPDC review with the most recent NCAEP report in relation to changes that were made by the NCAEP on the basis of new evidence. As can be seen, 20 of the 27 EBPs reported by Wong et al. (2014) remained

unchanged in the NCAEP report; only three changes were made (shown in bold) to reflect new evidence supporting their wider applicability.

Table 2.4

Comparison of the EBPs reported by NCAEP and NPD Reviews

EBPs as reported by Steinbrenner et al. (2020) and Wong et al. (2014)	**Comparison Note**
1. Antecedent-based Interventions	Identical in both reviews
2. Cognitive Behavioural/Instructional Strategies	Expanded to incorporate academic-focused interventions.
3. Differential Reinforcement	Identical in both reviews
4. Discrete Trial Training	
5. **Exercise and Movement**	Expanded to incorporate mind-body interventions such as yoga
6. Extinction	Identical in both reviews
7. Functional Behaviour Assessment	
8. Functional Communication Training	
9. Modelling	
10. Naturalistic Intervention	
11. Parent-Implemented Interventions	
12. Peer-Based Instruction and Intervention	Expanded to include adult-mediated interventions with peers
13. Prompting	Identical in both reviews
14. Reinforcement	
15. Response Interruption/ Redirection	
16. Self-Management	
17. Social Narratives	
18. Social Skills Training	

19. Task Analysis
20. Technology-Aided Instruction and intervention
21. Time Delay
22. Video Modelling
23. Visual Supports

In addition to these changes, the NCAEP team introduced five new teaching practices that had acquired further supporting evidence and met the inclusion criteria for EBPs. These were: augmentative and alternative communication; behavioural momentum intervention; direct instruction; music-mediated intervention; and Ayres sensory integration (Steinbrenner et al., 2020). The NCAEP team also merged several EBPs into existing teaching categories. For example, picture exchange communication systems were now classified within augmentative and alternative communication, scripts were merged into visual support, and pivotal response training was merged into naturalistic interventions. Some previously identified EBPs, such as joint attention and theory of mind interventions, were no longer considered as EBPs themselves but as domains or instructional outcomes. The NCAEP also listed a number of emerging teaching practices (e.g., auditory integration training, matrix training and exposure) that had some evidentiary support but not enough to qualify as evidence based.

While the NCAEP report contained detailed information about the procedures and methodologies employed in the identification of EBPs, the stated goal was to connect research knowledge with actual practice by assisting "personnel in early intervention, schools, clinics, and other human service programs search for practices that could be most effective when working with children and youth with autism" (Steinbrenner et al., 2020, p. 7). Accordingly, a significant proportion of the report was dedicated to descriptions of EBPs. This includes precise definitions, potential outcomes, and target age groups, along with a list

of research references. In this way, the report provides guidance for teachers and parents on suitable teaching practices for a child of a certain age who struggles with particular skills, as well as the expected outcomes.

2.4.12 Why Evidence-Based Practices Matter

Research has consistently linked the use of EBPs to better outcomes for students with autism. EBPs have been found in numerous peer-reviewed studies to play a significant role in achieving meaningful improvements and meeting the various needs of individuals on the spectrum (Hume et al., 2021). Systematic reviews conducted by multiple research teams (e.g., Odom et al., 2010; Steinbrenner et al., 2020; Wong et al., 2014) have screened over 1,000 efficacy studies and classified teaching practices into different levels of evidence (evidence-based, promising, emerging and unsupported practice) in order to identify those teaching practices that have shown positive outcomes in teaching social, academic, communication, or adaptive skills to individuals with autism (Horner et al., 2005; Hume et al., 2021; Reichow et al., 2008; Simpson, 2005). These findings can also serve as a filter to prevent the dissemination of myths and misleading information about ‘miracle cures’ that lack supporting evidence and, in many cases, are harmful for individuals with autism (Travers, 2017).

These considerations are particularly significant given the increasing number of individuals diagnosed with autism and the challenge faced by schools of adopting appropriate teaching practices to meet students’ academic and developmental needs (Dingfelder & Mandell, 2011; Garrad et al., 2022). In response, policy makers in numerous countries have introduced legislation to ensure that educational interventions are supported by research evidence. Examples include the Individuals with Disabilities Education Act (IDEA) and the No Child Left Behind Act (NCLB) in the United States (Yell, 2012) and the Regulations of Special Education Programs and Institutes (RSEPI) in Saudi Arabia (Alquraini, 2013), which emphasise the importance of utilising EBPs and strongly encourage schools to provide

teachers with training opportunities and access to necessary materials and methods to facilitate their implementation in classrooms.

As previously discussed, autism is a complex condition characterised by heterogeneous symptoms, with both challenges and areas of strength (Happé & Frith, 2020). These multifaceted characteristics have important implications for ensuring the equitable allocation of time and resources to ensure that interventions are tailored to individual needs, often requiring delivery through one-to-one teaching. Families, schools and governments continue to bear a considerable burden in meeting these unique learning needs (Cidav et al., 2012; Lavelle et al., 2014). Accordingly, it is vital to ensure that investment is not directed towards educational interventions that have limited research support or have been proven to be ineffective. EBPs play a crucial role in preventing wastage of time and effort and directing resources towards strategies that have been demonstrated to achieve the desired outcomes for students with autism (Travers, 2017). In addition to enhancing students' development and educational growth, all stakeholders benefit from the implementation of a sustainable and equitable system based on continuously updated information about best teaching practices for students with autism (Luskin-Saxby & Paynter, 2018; Rue & Knox, 2013).

In this context, a plethora of research studies has demonstrated that the use of EBPs has a direct and measurable positive impact on key skill domains for students with autism across all age groups (Hume et al., 2021). The field has reached a level of maturity in determining EBPs, with several decades of published systematic reviews that identify which teaching practices should be used and for which target skills (Boyd et al., 2022; Steinbrenner et al., 2020). The results of these reviews are summarised in Table 2.5.

Table 2.5

Impact of EBPs on Students with Autism Across Key Developmental Domains

Domain	Examples of EBPs	Proven Implementation Impact
Social	Peer-Based Instruction and Intervention, Video Modelling, Social Skills Training and Social Narratives.	Improvement in areas such as social initiation, reciprocity, conversational skills, understanding social norms and building and maintaining relationships.
Communication	Functional Communication Training, Augmentative and Alternative Communication and Visual Supports	Improvement in areas such as functional communication, verbal and non-verbal communication and alternative communication skills and systems.
Behavioural	Functional Behavioural Assessment, Reinforcement, Differential Reinforcement, Extinction and Response Interruption/Redirection.	Improvement in areas such as self-regulation, and reduction in repetitive, self-injury, aggression and off-task behaviours.
Academic	Direct Instruction, Task Analysis, Visual Supports, Technology-aided Instruction and Intervention and Discrete Trial Teaching.	Improvement in areas such as reading and math proficiency and school engagement, and decrease in school dropout.
Cognitive	Technology-aided Instruction, Cognitive, Behavioural/Instructional	Improvement in areas such as attention, problem-solving, retention and executive functioning skills

	Strategies and Intervention and Naturalistic Intervention	
Motor	Exercise and Movement and Ayres sensory integration	Improvement in areas such as movement, fine and gross motor skills, sensory functioning and body awareness.

Note. Several EBPs can impact more than one domain, thereby supporting the development of various skills simultaneously.

2.5 The Research-to-Practice Gap in Autism Education

The implementation of EBPs in the school context is vital for enhancing academic outcomes for all students. However, special needs students, including those diagnosed with autism, have a more pressing need for the most effective teaching practices in order to achieve their full potential in school settings (Cook et al., 2013b). A plethora of scientific evidence has indicated that the fundamental diagnostic features of autism, such as difficulties in communication and social skills as well as other adaptive behaviours, can be effectively addressed by the appropriate selection and implementation of EBPs (Carr, 2016; Garrad et al., 2022; Sam et al., 2021; You et al., 2024). As discussed above, numerous research efforts have been directed toward developing a comprehensive synthesis of the research literature on EBPs in order to produce and disseminate high-quality, user-friendly guidelines for teachers, parents and other practitioners (e.g., NAC, 2009, 2015a; Odom et al., 2003; Odom et al., 2010; Roberts et al., 2016; Steinbrenner et al., 2020; Wong et al., 2014). Despite these initiatives, however, the gap between research knowledge and practice, identified in the previous decade, persists to this day (Boyd et al., 2022; Cook et al., 2013b; Dingfelder & Mandell, 2011; Guldberg, 2017; Lee et al., 2025; Odom et al., 2021).

The research-to-practice gap is manifested in the school context by teachers' use of ineffective and harmful teaching practices, inappropriate use of EBPs, or even a lack of awareness of available EBPs (Alatifi et al., 2023; Barry et al., 2021; Cook et al., 2013b; Knight et al., 2019; Paynter et al., 2017). In a recent study, Atas et al. (2023) indicate that teachers of students with autism carry a positive attitude and agree about the significance of EBPs. However, they themselves reported using a very small number of EBPs and lacking knowledge about several others. In this context, it is crucial to note that autism education is not completely disconnected from research knowledge. Rather, findings from several research studies suggest that teachers of students with autism are using a mix of EBPs and unsupported teaching practices that do not align with the amount of high-quality research-based knowledge that is available (Cook et al., 2013b; Knight et al., 2019; Paynter et al., 2017; Paynter & Keen, 2015).

2.5.1 Current Status of EBP Knowledge and Use in Saudi Arabia

Limited research has been conducted on the level of knowledge and frequency of use of EBPs by teachers of students with autism in Saudi Arabia. However, a small number of recent studies have examined the status of EBP use in Saudi Arabia.

Alhossein (2021) surveyed 240 teachers who work with students with autism in a special education program in Riyadh, Saudi Arabia. The survey was designed to measure the knowledge and use of EBPs using a Likert scale. Results indicated a medium level of both knowledge and use of EBPs, and a significant underutilisation of particular strategies, such as scripting, social narratives, time delay, and video modelling This finding indicates the existence of a critical gap between research and practice in the Saudi Arabian educational context.

Alghamdi (2021b) employed a mixed-methods research design to investigate the implementation of EBPs among teachers of students with autism in Saudi Arabia, with

particular focus on the prevalence of specific EBPs and teachers' undergraduate preparation and training. Like Alhossein (2021), the researcher employed a quantitative survey to investigate teachers' knowledge about EBPs and reported mixed results. While the participants reported high levels of confidence and knowledge in relation to many common teaching practices, such as Modelling and Functional Behavioural Assessment, their knowledge of highly structured and advanced EBPs, such as Discrete Trial Teaching (DTT) and Picture Exchange Communication System (PECS), was limited. This knowledge gap is significant given the effectiveness of these particular practices in supporting the development of communication and social skills among students with autism.

Alatifi et al. (2023) employed a quantitative self-report survey to investigate knowledge and use of three different categories of teaching practice and teachers' attitude toward the implementation of EBPs. This is one of very few studies conducted in Saudi Arabia that have measured and compared different categories of teaching practice (EBPs, EM and UN). Uniquely, this study drew on a relatively large and geographically diverse sample, thereby addressing an important limitation of previous studies conducted in Saudi Arabia. The results showed that EBPs such as reinforcement, prompting, visual supports, and extinction were the most used in Saudi classrooms, with significantly less frequent use of strategies such as speech-generating devices, pivotal response training, and time delay.

Comparative analysis revealed a statistically significant difference between the mean scores of the three teaching practice categories. The EBPs category scored highest, followed by UN, and then EM. Paradoxically, Saudi early professionals reported greater knowledge and use of UN compared to EM teaching practices, which contrasts sharply with the pattern observed in Western studies, where teachers always scored EM teaching practices higher than UN (e.g., Paynter et al., 2017; Paynter & Keen, 2015). This may be due to the tendency of early professionals in Saudi Arabia to choose common teaching practices regardless of their

supporting evidence. Other scholars have highlighted the urgent need to address this research-to-practice gap in autism education (Boyd et al., 2022; Guldberg, 2017). Alatifi et al. (2023) conclude that bridging the gap will not only prevent the waste of time and resources but also, and more importantly, facilitate the provision of the best possible educational opportunities and academic growth for students with autism in Saudi Arabia (Alatifi et al., 2023).

The combined evidence from these studies indicates varied levels of knowledge and use of EBPs and other teaching practice categories among teachers of students with autism in Saudi Arabia. Further research is needed to provide a more nuanced understanding of teachers' knowledge, teaching practices, and attitude towards and adherence to intervention fidelity (Knight et al., 2019). In the Saudi context, such research requires investigations at the national and ministerial levels and the inclusion of students with autism across different regions of Saudi Arabia (Ibrahim & Alotaibi, 2024). While it is important to shed light on the current level of teachers' performance by examining their levels of knowledge and use, research should also explore methods for overcoming implementation barriers associated with cultural fit and adaptation of EBPs to suit the local context (Alatifi et al., 2023).Finally, the employment of a greater diversity of research methods and tools is desirable to decrease reliance on quantitative surveys and incorporate more qualitative data collection techniques, including direct observation Guldberg, 2017; Paynter et al., 2020).

2.5.2 The Negative Impact of Disconnection

Any disconnect between research knowledge and actual practice is likely to result in missed opportunities for quality improvement as well as wasted time, effort and resources. In the context of autism education, although various stakeholders are affected by the persistence of this gap, the greatest impact falls on students with autism, who are at the core of the educational process. As Cook et al. (2013b) suggest, the research-to-practice gap in special

education places “an artificial ceiling on the achievement of students with learning and behavioural disabilities” (p.1). Kasari and Smith (2013) support this view, arguing that the inadequacy of school-based interventions for students with autism often leads to poor outcomes. Others go so far as to claim that young adults with autism are the most poorly served of any disability group (Odom et al., 2020; Roux et al., 2017).

Teachers of students with autism are also negatively impacted by the research-to-practice gap. While teachers and school administrators are aware of the importance of adopting and implementing EBPs, they are Constrained by numerous personal, administrative and societal barriers (Barry et al., 2020; Domitrovich et al., 2008). Cook et al. (2013b), for example, commented on the struggle of special education teachers, who received “mixed and sometimes misleading messages during pre- and in-service training as to what instruction is the most effective” (p. 6). School administrators also face pressure and criticism because of their inability to meet parents' and advocates' expectations as they are unprepared to utilise EBPs (Dingfelder & Mandell, 2011). Finally, the gap in autism education impacts government finances and individual taxpayers, especially when high costs do not achieve optimal outcomes. In fact, students with autism incur higher costs in education-related services than ordinary students, mainly due to the costs of special education (Kasari & Smith, 2013; Lavelle et al., 2014).

2.5.3 Explaining the Research-to-Practice Gap in Autism Education

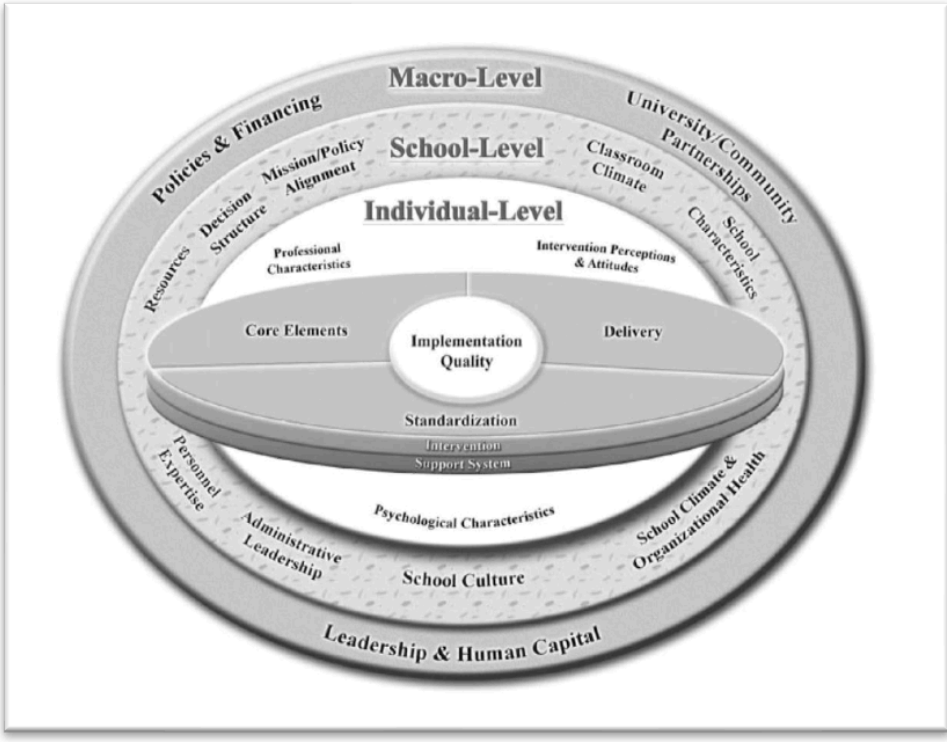
The literature on autism education identifies several interacting factors that contribute to the research-to-practice gap. One of the primary reasons behind the gap is the mismatch between the controlled environment in which EBPs were examined by researchers and the school context where teachers implement them in real-life settings (Kasari & Smith, 2013). While researchers often examine teaching practices with small groups and homogeneous students, teachers in schools must deal with a diverse range of students from various

backgrounds and with different levels of severity, as well as at times, co-occurring conditions. As Dingfelder and Mandell (2011) point out, “children enrolled in efficacy studies represent only a subset of those served in community settings” (p. 4). Guldberg (2017) attributes the gap to the dominance of experimental designs in research, arguing that the problem does not simply reflect the failure of teachers to translate knowledge into practice.

Even when EBPs are easily accessible and align with the school context, there are still numerous obstacles to the successful implementation of these teaching practices: “despite interest in the use of evidence-based prevention programs by school districts, theory and research remain limited on how to move these programs into general practice with high-quality implementation” (Domitrovich et al., 2008, p. 7). Domitrovich et al. (2008) present a conceptual framework for analysing the complex environment of schools. They propose a multi-level model (macro, school and individual-level) of factors that influence the adoption and implementation of EBPs in school settings (Figure 2.1).

Figure 2.1

The School Multi-Level Model for Enhancing Implementation Quality



Note. This figure demonstrates a conceptual framework of three-level factors that influence implementation quality in school settings. Adapted from Domitrovich et al. (2008).

Barry et al. (2020) applied this framework to synthesise research on the barriers to implementation in autism education, and were able to identify concrete evidence of the influence of these three levels of barriers in autism education. A recurring theme in this review was the existence of important barriers, such as a lack of time and resources, at the school level. At the individual level, the review identified insufficient ongoing training and a lack of support from administrators as significant barriers. At the macro level, Barry et al. (2020) found that cultural differences were reported in many studies as creating a barrier to the implementation of EBPs.

The gap has also been attributed to the different priorities of researchers and teachers. Kasari and Smith (2013) suggest that researchers' main concern revolves around autism symptoms and prioritising the mitigation of core deficits in social and communication skills, while teachers are accountable for achieving academic goals. Others have suggested that the gap is the result of the narrow and non-representative samples recruited in research studies. In this context, Steinbrenner et al. (2020) argue that education research in autism fails to report “for whom” the intervention is designed. They emphasise that EBPs are assumed to be effective for those diagnosed with autism regardless of their background. However, among the very few studies that reported information on participants’ background, the dominant group recruited for efficacy studies were from the white middle class population (Dingfelder & Mandell, 2011; Steinbrenner et al., 2020). When researchers do not report the racial, cultural or socioeconomic background of their participants, the generalisability of their findings is limited and unlikely to be equally applicable to all teachers (Barry et al., 2024; Steinbrenner et al., 2020).

Of course, the research-to-practice gap is not confined to autism education (Cook & Odom, 2013) but has been identified across education broadly and, indeed, in other

disciplines such as healthcare. In this context, lessons can perhaps be drawn from the field of healthcare, where researchers have sought with some success to bridge the gap by employing implementation science (IS) theories, models and frameworks (Glasgow et al., 1999; Graham et al., 2006; Kitson et al., 1998). As a result, many prominent researchers in special education have recommended that IS frameworks be employed to facilitate knowledge integration in autism education, arguing that the deployment of such frameworks can be equally effective in other fields, including autism education (Boyd et al., 2022; Lee et al., 2025; Luskin-Saxby & Paynter, 2018; Odom et al., 2020).

2.5.4 Barriers to EBP Use in Saudi Arabia

While it is vital to identify knowledge-practice gaps, it is equally important to explore barriers to the implementation of EBPs. This section explores the barriers to EBPs implementation in Saudi Arabia, with particular focus on teachers' knowledge, access to information and training, and contextual barriers.

2.5.4.1 Insufficient Knowledge about EBPs

Research conducted in Saudi Arabia indicates a strong positive relationship between knowledge of EBPs and their implementation, with a lack of familiarity inevitably linked to lower levels of implementation (Alatifi et al., 2023; Alhossein, 2021; Almughyiri, 2024; Ibrahim & Alotaibi, 2024). This aligns with the findings from quantitative research elsewhere, which consistently reports statistically significant correlations between knowledge and use of EBPs among teachers of students with autism (Hsiao & Sorensen Petersen, 2019; Paynter et al., 2017; Paynter & Keen, 2015). For example, Ibrahim and Alotaibi (2024) found that teachers of students with autism in Saudi Arabia lacked sufficient knowledge about EBPs and expressed little desire for related in-service training, while analysis of qualitative data from the same study indicated a negative attitude toward EBPs implementation.

At the same time, familiarity with an EBP is not sufficient to ensure its correct implementation (Scheeler et al., 2016). Numerous interventions are complex and have specific protocols for execution, which may present another barrier to their implementation (Alatifi et al., 2023; Alhossein, 2016; Ibrahim & Alotaibi, 2024). A common barrier among teachers in Saudi Arabia is their inability to differentiate between EBPs and UN teaching practices (Ibrahim & Alotaibi, 2024). In the study by Alatifi et al. (2023), teachers rated UN teaching practices notably higher than emerging practices.

2.5.4.2 Limited Access to Information and Training

Peer-reviewed guidelines for EBPs (e.g., Steinbrenner et al., 2020; Wong et al., 2014) incorporate information about outcome areas, specific target skills, and age ranges for each EBP (e.g., Steinbrenner et al., 2020; Wong et al., 2014). However, teachers in Saudi Arabia identified selection procedures and access to EBPs information as barriers to EBPs implementation (Alatifi et al., 2023; Alghamdi, 2021b).

Although numerous studies conducted in Saudi Arabia identify the need to enhance access to sources of information about EBPs and recommend greater investment in training opportunities for teachers of students with autism, none of them describes specific training models (Almughyiri, 2024; Almutlaq, 2021; Kelly et al., 2024; Sulaimani & Gut, 2019). Printed guidelines and other written materials about EBPs are passively disseminated rather than actively providing specific recommendations for improving teachers' implementation knowledge and abilities (Ibrahim & Alotaibi, 2024). In fact, the literature repeatedly identifies accessibility and professional development as obstacles to implementation that reflect the research-to-practice gap.

In this context, Alatifi et al. (2023) employed a modified version of the Sources of Information Scale (Carlon et al., 2015) as part of an online survey to measure how Saudi professionals seek information about EBPs. Results indicate that other teachers were the most

common resource (83.7% of the sample), followed by professional development within the workplace (71.7%), and general web searches (70.5%). In contrast, research literature (32.5%) and books (19.9%) were ranked lowest (Alatifi et al., 2023). Participants in a qualitative investigation by Almutlaq (2021) highlighted the lack of resources providing crucial information on addressing communication difficulties in students with autism, including instructions on how to implement PECS and AAC and how to assess outcomes. Limited access to information has been identified as a barrier across several other studies in Saudi Arabia (Ibrahim & Alotaibi, 2024; Kelly et al., 2024; Sulaimani & Gut, 2019), as well as in western literature (Barry et al., 2020; Knight et al., 2019; Paynter et al., 2017).

Other research indicates that improved access to professional training increases knowledge and use of EBPs. For example, Alhossein (2021) found that participation in professional development training positively impacted the knowledge and use of EBPs among Saudi teachers. However, the study did not describe the model or content of the training program. Similarly, Barry et al. (2021) reported that attendance at programs in autism education was linked to greater knowledge and use of EBPs. In Saudi Arabia, the dominant approach to professional development is via generic training programs. In-service training is rarely designed to address the pre-identified needs of teachers in relation to EBPs implementation. According to Ibrahim and Alotaibi (2024), in-service training for EBPs in Saudi Arabia is occasional and incidental and suffers from geographical inequality, with most training initiatives taking place in large cities. In addition, the authors suggest, the impact of training on EBPs knowledge and use is limited because it is overly theoretical and is mainly delivered through lectures, to the neglect of active training, direct monitoring and hands-on coaching.

Sulaimani and Gut (2019) also discuss professional training programs as one of the challenges associated with autism education in Saudi Arabia. They observe that such

programs are limited in number, and there is a lack of trained professionals to deliver them. Accordingly, they recommend that educational authorities increase investment in professional recruitment and training. In a study by Almutlaq (2021), teachers reported that a lack of training opportunities in ABA-teaching strategies was a major barrier to their ability to implement them. In the qualitative component of the study, participants recommended that in-service training in ABA techniques should be compulsory for all teachers working with students with autism. Kelly et al. (2024) explored the educational interventions and ABA services in the Gulf region, including Saudi Arabia, with results and recommendations consistent with those of the other studies reported here. However, they emphasised other local barriers, such as the limited number of ABA-certified professionals and programs, the absence of local contextualised research and insufficient university preparation.

2.5.4.3 Misalignment of EBs with the Local Context

In Arab Muslim societies like Saudi Arabia, culture, language and religion are directly relevant to assessing the applicability of EBPs (Olsen & Kelly, 2020). Yet little attention has been paid to the role of cultural factors in identifying and implementing EBPs for students with autism in these school settings (Blair et al., 2020; Lee et al., 2025; Olsen & Kelly, 2020). Although local culture in Saudi Arabia does not in itself present a barrier, failure to make appropriate adaptations could create a barrier to implementation. A limited number of studies have explicitly addressed the unique cultural challenges faced by Arab countries, including Saudi Arabia, in the adoption and implementation of EBPs in the autism education context (Alallawi et al., 2020).

Alotaibi et al. (2016), for example, examined the impact of cultural factors on the implementation of a particular EBP, Social Narrative, in Saudi Arabia. They found that, although special education teachers expressed a positive attitude toward Social Narratives as a technique for teaching social skills, they reported that the available Social Narratives were

inappropriate for use in the local context because they reflected Western values and practices. As a result, many of them could be confusing rather than helpful for children with autism because they contradicted aspects of local lifestyle, customs, language and Islamic beliefs, such as dress code.

A systematic scoping review conducted by Alallawi et al. (2020) identified various aspects of culture in Arabic-speaking countries, including Saudi Arabia, that created significant barriers to diagnosis and social support as well as interventions. The authors highlighted the Western-centric nature of most EBP research and the limited number of studies that have been conducted in the Arab context. In fact, the lack of contextually relevant research, especially studies examining treatment outcomes, is one of the most frequently discussed topics in the literature on barriers to implementation in Arabic countries (Hussein & Taha, 2013; Kelly et al., 2024; Kelly et al., 2016; Sulaimani & Gut, 2019). In addition, the methodology employed in much of the existing research in the region is methodologically weak, which casts doubt on the reliability and robustness of the findings (Alallawi et al., 2020). Finally, language bias in literature has also been identified as a significant barrier to the implementation of EBPs. This is because most published research on autism education, including that conducted by Arab researchers, is written in English, which limits accessibility to the local database (Alallawi et al., 2020; Alghamdi, 2021b; Kelly et al., 2024).

2.5.4.4 Organisational-Level Barriers

Domitrovich et al. (2008) identified organisational-level factors, such as administrative leadership, school climate, and the availability of resources and materials, as critical barriers to the successful adoption and implementation of EBPs. Barry et al. (2020) reviewed a number of studies on identified barriers to and facilitators of EBPs implementation in autism education across geographically diverse countries. Several of these studies, including Alotaibi et al. (2016) in Saudi Arabia, reported that school-level barriers,

including lack of resources and materials, limited teachers' ability to utilise numerous EBPs such as social skills training, naturalistic behavioural and visual supports. Lack of access to technology and appropriate materials were specifically reported as a barrier to the use of social stories in the classroom. In this context, Alasmari (2021) found that teachers of students with autism in Saudi Arabia commonly reported a lack of assistive technology (AT) resources as an obstacle. In many Saudi educational centres, teachers are expected to provide necessary materials and tools themselves, which significantly increases the difficulty of implementing EBPs in the classroom (Ashour & Bagadood, 2022).

This situation reflects the existence of a significant gap between policy in autism education and classroom practices (Ibrahim & Alotaibi, 2024; Kelly et al., 2016). According to Ashour and Bagadood (2022), Saudi autism centres and schools lack the structured administrative systems that are necessary to ensure that roles are effectively distributed, and which support the adoption and implementation of interventions. In high power distance contexts like Saudi Arabia (Hofstede et al., 2010; Olsen & Kelly, 2020), it is crucial that EBPs are initially adopted by the highest education authorities. However, there is an absence of appropriate regulations to enforce the use of EBPs at the school level (Alotaibi, 2023). In several qualitative studies, teachers commented that supervisors and school administrators often have no interest in or enthusiasm for EBPs, preferring traditional teaching methods. These studies reported additional school-level obstacles, including insufficient cooperation among school staff, negative attitudes and low motivation among peers, large class sizes and limited instructional time (Ashour & Bagadood, 2022; Ibrahim & Alotaibi, 2024).

2.5.5 Adapting EBPs for Arab Muslim Populations with Autism

It is very important to recognise cultural complexity and address cultural influences on the school context, including developing awareness of local formalities, religion and norms (Al-Qahtani & Efstratopoulou, 2025; Olsen & Kelly, 2020). Cultural differences

directly shape teaching, curriculum, and classroom management. Ignoring these differences creates conflict and hinders EBP implementation (Evans et al., 2019; Ouyang et al., 2025). For example, most, if not all, students in Saudi schools share a common cultural background as Arab Muslims (Alnahdi et al., 2019). However, EBPs in autism education are predominantly represented and examined in a Western socio-cultural context (Dingfelder & Mandell, 2011b; Hassan, 2019; Steinbrenner et al., 2020). Accordingly, Olsen and Kelly (2020) emphasise the importance of understanding key cultural factors that teachers working with Arab-Muslim populations with autism need to consider to ensure successful adoption of EBPs.

The six dimensions of Hofstede et al.'s (2010) model of national cultures can serve as a foundational framework for understanding the local cultural characteristics of Arab-Muslim populations, including Saudis. The first of these dimensions is power distance. Arab-Muslim countries are characterised by high power distance, meaning that authority within government, organisations, and even families is hierarchically structured. Other characteristics of Arab Muslim cultures identified by Hofstede et al. (2010) and other Arab researchers (e.g., Najm, 2015) include: traditional orientation, collectivist and masculinist orientation, and avoidance of uncertainty in relation to roles and behaviour. Although these behavioural characteristics are common across Arab-Muslim populations, there is variability in individual countries (Olsen & Kelly, 2020).

Numerous challenges to the adoption and implementation of EBPs exist in Arab-Muslim countries, such as Saudi Arabia, where traditional cultural beliefs and practices are widely embraced (Hofstede, 2011; Ibrahim & Alotaibi, 2024). In the school context, many of these countries continue to adopt traditional teaching methods for a variety of reasons, including their familiarity and cost-effectiveness (Karami-Akkary, 2014), while more recently disseminated practices, such as EBPs, may be considered a threat to older-

established educational perspectives (Olsen & Kelly, 2020). Moreover, in high power distance contexts, teachers are at the centre of the educational process and are highly respected (Hofstede, 2011). At the same time, however, their ability to initiate the use of EBPs is limited, as such decisions are made by higher authorities (Al Qurashi, 2013). The hierarchical decision-making process requires multiple layers of approval, which slows change and impedes immediate, necessary responses. Likewise, school communities characterised by high avoidance of uncertainty are attached to routine and resist innovation. The iterative processes involved in implementing EBPs are therefore considered risky, because they require the adoption of recently developed methods and continuous modification (Kole, 2025).

Masculinity and restraint behaviours are two additional cultural factors that can pose a barrier to the adoption of EBPs in school settings for students with autism. Masculine traits encourage narrow school success criteria that depend on examinations, the attainment of the highest scores, and competition among students (Kole, 2025). Similarly, a restrained school climate always favours self-control and adherence to rules and routine. However, numerous EBPs emphasise modern educational approaches such as exploration and active participation, which prioritise the learner role (Ouyang et al., 2025).

Olsen and Kelly (2020) conducted one of very few studies to have examined the implications of cultural influences for teachers who work with students with autism in Arab-Muslim populations. Among other issues, they consider the implications for teaching practice of cultural influences on communication, family dynamics, religiosity, and the role of Islam in human relationships. First, they highlight the need for awareness of the high-context communication style characteristic of Arab cultures. In Arab culture, verbal messages tend to be delivered with implicit meanings, sometimes through contextual cues. This stands in sharp contrast to the communication style of most Western populations. Given that a degree of

stigma continues to be attached to children with special needs and their families in the region (Kelly et al., 2016; Sulaimani & Gut, 2019), teachers must ensure that communication about students' issues is appropriately indirect and circumspect.

Second, as stated earlier, Arab Muslim culture is characterised by high power distance and collectivist values, and an extended family structure is the norm. Therefore, the involvement of parents and older relatives in decision-making about intervention and adoption of EBPs is key to students' progress. As Olsen and Kelly (2020) emphasise, "training of family members in evidence-based practice should go beyond parents to include extended family members" (p. 89). The centrality of family in the Arab-Muslim context also requires teachers to develop good personal relationships with parents and other relatives, which might include the acceptance of small gifts and invitations to share food.

Third, Islamic teachings in Arab-Muslim communities shape values, determine roles and relationships, and influence almost all aspects of daily behaviour (Al-Qahtani & Efstratopoulou, 2025). Accordingly, it is essential for those working within such cultures to develop a basic understanding of Islamic principles (Olsen & Kelly, 2020). For example, during the holy month of Ramadan, some students with autism may fast during the day, which necessitates some modifications to daily activities, including less time for teaching sessions and meetings. Moreover, the applicability of EBPs and the selection of educational goals are likely to be assessed in relation to their fit with Islamic teachings and values (Alotaibi et al., 2016; Kelly et al., 2024; Slim & Reuter-Yuill, 2021).

While many Arab-Muslim cultural characteristics may be viewed as presenting a barrier to the adoption of EBPs, their deep embeddedness in everyday needs to be acknowledged. Moreover, they should not be seen in unequivocally negative terms, and context-specific adaptations can be made to enable the successful implementation of EBPs for students with autism in Arab-Muslim schools (Olsen & Kelly, 2020). For example, the

centralised decision-making structure can be accommodated by ensuring that the adoption of EBPs is supported and accepted by senior education authorities, including the school administration. Similarly, the link between academic achievement and the implementation of EBPs can be emphasised to address the 'masculine' association with competitive success. Further, the development of practical local teaching guidelines and clear strategies can help to clearly align such implementation with the need to avoid uncertainty (Ouyang et al., 2025). Finally, the successful implementation of EBPs in schools with collectivist values can be encouraged through group decision-making and group training, thereby enhancing a sense of community (Kole, 2025; Ouyang et al., 2025).

2.6 Implementation Science

IS, as a discipline, is considered a relatively new field of study that achieved recognition approximately 25 years ago, but its origins can be traced back to the 1930s and 1940s (Estabrooks et al., 2018). EBP and IS fields are closely complementary. While the EBP represents the core intervention component of any implementation endeavour (Fixsen et al., 2005), the IS theories and frameworks provide structural plans and tools to facilitate and guide the EBP integration into practice routine (McNett et al., 2021). In fact, it has been suggested that interest in IS concepts and methodology significantly increased when they were linked to the EBP movement (Albers et al., 2020).

This relationship has been illustrated by Albers et al. (2020) in their analysis of publication trends in the academic literature on EBP and IS between 1998 and 2017. They found that searches for EBP-related terms in multiple databases displayed a gradual but consistent increase from 2000 onwards, while terms related to implementation began to show an increase beginning around 2009. These patterns appear to indicate that the proliferation of EBP research contributed to the later increase in IS publications. Furthermore, the dramatic increase in IS research production may also be attributed to the establishment of peer-

reviewed journals such as *Evidence and Policy* and *Implementation Science* in 2005 and 2006, respectively (Albers et al., 2020). Many IS frameworks have been successfully employed in the medical field and elsewhere, leading to the development of models that are capable not only of transferring knowledge into practice but also of ensuring sustainable outcomes (Field et al., 2014; Kitson & Straus, 2010; Milat & Li, 2017).

2.6.1 Use of Theory to Guide Implementation Processes

IS has gradually moved toward greater utilisation of theories, frameworks and models to provide robust explanations of implementation facilitators and barriers (Albers et al., 2020; Nilsen & Bernhardsson, 2019). According to Nilsen (2020), early research approaches in IS did not consider the usefulness of employing theoretical frameworks when empirically attempting to transfer research knowledge into practice. With only ten per cent of studies providing a solid justification of their methodological choice (Davies et al., 2003), the drawback of having no theory elevated a problematic issue in IS that can be accurately described as an expensive guessing game with no ability to expect implementation success or replicate it (Eccles et al., 2005). On the contrary, others have argued that there is no need for theory-based implementation; instead, common sense will guide the execution process (Oxman et al., 2005). Nonetheless, there is a considerable body of literature that supports the value of developing and utilising theory to aid the uptake of research knowledge. Today, the challenge has turned from deciding whether a suitable IS theoretical framework exists to determining which theory is the best fit (Nilsen & Birken, 2020).

2.6.2 Theories, Models and Frameworks in IS

At this point, it is worth noting that, although concepts such as theory, model, or framework in IS have been used interchangeably, they are distinct. Despite multiple research attempts to distinguish between these terms, the IS literature still needs to demonstrate precise and uniform terminologies (Colquhoun et al., 2014; Rycroft-Malone & Bucknall,

2013). Nilsen (2022) affirmed that “neither models nor frameworks specify the mechanisms of change; they are typically more like checklists of factors relevant to various aspects of implementation” (p. 34). Colquhoun et al. (2014) argue that in many scientific fields, the challenge and perplexing issues tend to be related to basic concepts and terminologies rather than progressed and more complex matters. This is, in fact, the case in IS, where uniform use of terminology is still an ongoing dilemma.

2.6.3 The Aims of IS Categories

IS theories, frameworks and models have been categorised into taxonomies to guide researchers in identifying the most suitable one for their particular purpose (Moullin et al., 2020). For instance, Nilsen (2015) created five categories: process models, determinant frameworks, classic theories, implementation theories and evaluation frameworks. Each of these is elaborated below, together with examples illustrating each category.

2.6.3.1 Process Models

Process models, such as the Knowledge-To-Action (KTA) framework (Graham et al., 2006) and the exploration, preparation, implementation, sustainment (EPIS) framework (Aarons et al., 2011), are both excellent examples of frameworks that describe the multilevel processes involved in fully integrating research knowledge into practice. These procedural models are critical tools in IS because they provide implementers with descriptions of what each step means, why it is required, and how it is executed. Process models can also guide the creation of research knowledge, identify gaps in research, and ensure that research knowledge is successfully adopted and sustained (Nilsen, 2015). A number of research studies have implemented the KTA framework (Bjørk et al., 2013; Petzold et al., 2010; Russell et al., 2010) and the EPIS framework (Beeber et al., 2022; Donenberg et al., 2019; Moullin et al., 2019) in the field of health science. The results have improved research implementation in health settings and hold great promise for future enhancements in knowledge translation.

2.6.3.2 Determinant Frameworks.

Implementation scientists recommend benefiting from determinant frameworks as a useful tool to systemically identify and describe factors that may hinder or support the implementation efforts (Wilson & Kislov, 2022). Determinant frameworks, such as the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009), differ from other IS framework categories in that they do not aim to identify the cause or the mechanisms of behavioural change (Nilsen & Bernhardsson, 2019). Although they have a narrower focus, these frameworks "are multilevel, identifying determinants at different levels, from the individual user or adopter (e.g., healthcare practitioner) to the organisation and beyond (Nilsen & Bernhardsson, 2019, p. 35). The CFIR has been widely employed in research (Bonawitz et al., 2020). It has been used to identify five distinct domains that can function as both obstacles and facilitators (e.g., characteristics of intervention and individuals, features of inner and outer settings and the implementation target). The Promoting Action on Research Implementation in Health Services (PARIHS) is another model that falls within the determinant frameworks category and serves a similar purpose as the CFIR framework. Other studies have adopted the PARIHS framework to identify implementation facilitators and barriers in medical and health science contexts (Drainoni et al., 2016; Schneider et al., 2016).

2.6.3.3 Classic Theories

The category of classic theories brings together a number of seminal behavioural theories, such as the Diffusion of Innovation Theory (Rogers, 2010), the Theory of Planned Behaviour (Ajzen, 1988; Ajzen, 1991), and Social Cognitive Theory (Bandura, 1977). These were originally developed outside the IS field by researchers in psychology, sociology and organisational science and have been employed in numerous health science studies (Nilsen, 2015). Nilson (2015) places them in a category of their own because they operate in

fundamentally different ways compared to research-to-practice models. He refers to them as passive theories, since they only seek to offer explanations for behavioural change but do not seek to develop strategies for change in a real-world setting. Various behavioural theories have been employed by implementation scientists to investigate behavioural changes in a clinical context. An example of a classic theory is the Theory of Planned Behaviour (Ajzen, 1988; Ajzen, 1991). Although this theory does not provide a framework for knowledge transformation, researchers in the medical field have used it to investigate COVID-19 risk perception and vaccination willingness (Bae & Chang, 2021; Guidry et al., 2021).

2.6.3.4 Implementation Theories

Implementation theories focus specifically on understanding particular aspects of implementation (Nilsen & Bernhardsson, 2019). Some of the theories in this category were purposefully developed to address this aim, while others represent modifications to pre-existing theories. They allow researchers to focus on specific aspects of implementation in order to obtain a more detailed understanding of their role (Nilsen, 2015). Examples of modified theories listed in this category are the Theory of Organisational Readiness (Weiner, 2009) and the Implementation Climate Theory (Klein & Sorra, 1996), both of which were developed to address organisational climate and culture. Another example of an implementation theory, the Normalisation Process Theory (NPT) (May & Finch, 2009), was initially developed to provide a systematic model of how new technology should be introduced into real-life settings (Nilsen, 2015). However, after extensive study and the accumulation of relevant research findings, it has evolved into a well-known theory with demonstrated value for explaining and guiding implementation processes in complex organisations across multiple contexts (McEvoy et al., 2014).

2.6.3.5 Evaluation frameworks

The fifth category, evaluation frameworks, comprises frameworks that provide methods for assessing implementation outcomes. According to Proctor et al. (2011), implementation scientists needed to develop specific methods and procedures for measuring implementation outcomes and distinguishing them from service system and clinical outcomes. Proctor et al. (2011) identified eight different implementation outcomes that required separate evaluation: "acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration, and sustainability" (cited in Nilsen, 2015, p. 66).

Similarly, the RE-AIM (Reach, Efficacy, Adoption, Implementation and Maintenance) framework developed by Glasgow et al. (1999) identifies implementation components that should be systematically assessed as part of the intervention process. Over time, the RE-AIM framework has been further developed and used to estimate public health impact, plan for the integration of new health policies, and determine target health needs at both individual and organisational levels (Milat & Li, 2017). It is one of the most commonly used implementation frameworks (Milat & Li, 2017), and has been widely deployed as an evaluation tool in various fields of study, including health and medical science (Glasgow et al., 2001; Jilcott et al., 2007), education (Austin et al., 2011) and psychology (Hone et al., 2015).

2.6.4 IS Frameworks to Bridge the Gap in Autism Educational Research

Many scholars argue that IS frameworks and models can be employed in the field of special education and autism to transfer knowledge into practice and achieve successful outcomes, as has been done in the health field (Brookman-Frazee & Stahmer, 2018; Luskin-Saxby & Paynter, 2018; Odom et al., 2020). Although some positive outcomes have been reported from the use of IS theories and frameworks in autism educational research, their feasibility and impact have been under-researched. Several IS frameworks have been

identified in the literature as potentially suitable for use in autism educational and clinical settings, and some have already been applied in real-world settings (Lee et al., 2025). The following discussion examines examples of IS frameworks and methods that have been employed in their original form or strategically adapted to suit the context of autism education, particularly the unique pedagogical needs of students with autism.

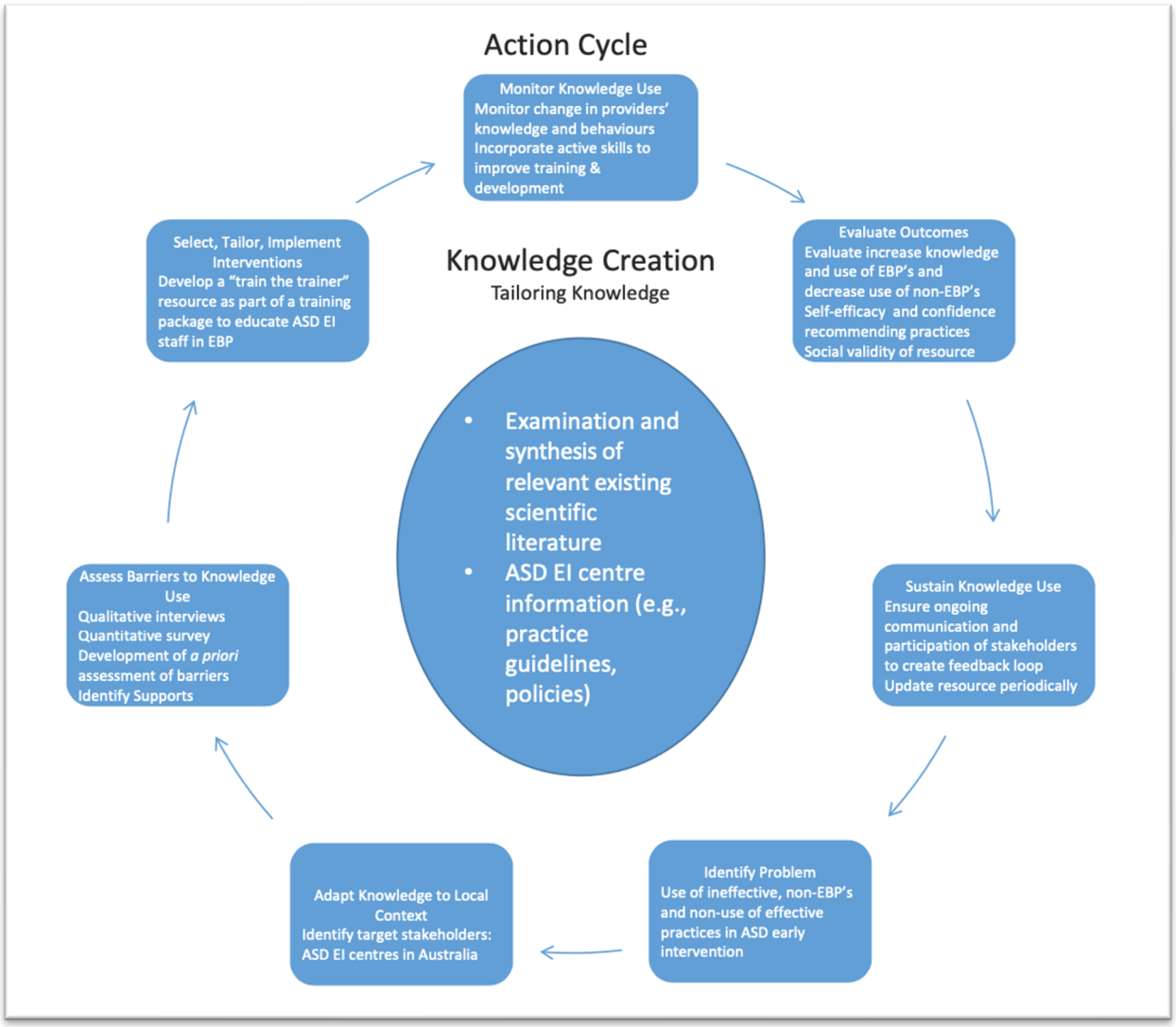
A good example of the adaptation of the IS framework for autism educational research was proposed by Boyd and his associates (2022). They adapted the well-known Exploration, Preparation, Implementation and Sustainment framework (EPIS) (Aarons et al., 2011; Moullin et al., 2019) to create a 6-phase framework using IS methods and tools (e.g., Fixsen et al., 2005; Moullin et al., 2019) to scale-up EBPs autism interventions. The first phase is community-partnered exploration, where researchers work in collaboration with stakeholders to determine the individuals' needs in relation to intervention priorities and ensure that potential interventions align with local values. This stage is followed by planning and identifying determinants (i.e., facilitators and barriers), resource acquisition, initial and large-scale implementation and, finally, sustaining intervention outcomes (Boyd et al., 2022). Key strengths of this framework lie in its emphasis on collaboration with the autism community throughout all implementation processes. According to Lee et al. (2025), this framework provides a roadmap for future research that links implementation phases with core outcomes such as feasibility, fidelity, appropriateness and acceptability of EBPs.

Another IS framework, the Knowledge-to-Action (KTA) framework, has been recommended for use in autism educational settings to enhance the adoption and implementation of EBPs. Luskin-Saxby and Paynter (2018) first discussed the potential of the KTA not only for improving teaching practice but also for sustaining the outcomes of EBP interventions in early autism centres. The KTA, as originally developed by Graham et al. (2006), has two core components: knowledge creation and the action cycle. Luskin-Saxby

and Paynter (2018) re-conceptualised the KTA framework to fit the autism intervention context (Figure 2.2). Rather than establishing a novel theory or set of guidelines, they identified context-specific actions and methods to be implemented within each phase of the action cycle in order to achieve the intended aim of each phase.

Figure 2.2

Re-conceptualisation of the KTA Framework for Autism Educational Settings



Note. This figure displays the action cycle of the KTA framework, including recommendations of methods to be implemented within each phase. Adapted from Luskin-Saxby and Paynter (2018).

For example, in phase three of the action cycle, which aims to assess barriers to knowledge use, they suggest adaptations in relation to the method of assessing barriers and

the levels which should be targeted in future research in the autism education context. Similarly, in phase five (selecting, tailoring and implementing interventions), they identify concrete, practical steps to *train the trainers*, emphasising that this phase "needs to incorporate supports for early intervention providers to select and know how to implement interventions based in the best available evidence, while also keeping child and family needs and resources in mind" (p. 161). Indeed, they stress the critical role of stakeholders across all KTA phases in relation to both knowledge creation and the processes of the action cycle. As an approach to bridging the research-to practice gap, this adaptation of a well-known and trusted framework that originated in the health science field is well-suited for application to the unique settings of autism education.

A number of special education researchers have also proposed IS frameworks and methods as a tool for improving the implementation of EBPs in educational settings. For example, Cook and Odom (2013) were among the earliest to recognise the research-to-practice gap in special education and to propose IS frameworks to address it. They discussed various IS models and frameworks that had been created in different contexts for different implementation-related purposes. For example, the RE-AIM framework (Glasgow et al., 1999) was developed to examine multiple dimensions and the complexity of implementation processes. Cook and Odom (2013) use it as an example to illustrate the challenges that can emerge during implementation and how these might be applied in special educational settings.

Cook and Odom (2013) also discuss the Schoolwide Positive Behaviour Support (SWPBS) framework, which had previously been employed in special educational settings, as a successful case study in the use of an IS framework. They highlight the incorporation into the SWPBS of five principles drawn from implementation science: contextual suitability, priority, effectiveness, efficiency, and using data for continuous regeneration. The National

Implementation Research Network framework (NIRN) (Fixsen, 2005) and the Professional Development Program for Autism are also examined as potential guidelines for addressing the gap in autism education. Overall, Cook and Odom (2013) advocate for the use of IS in special education settings, arguing that further analysis and adaptation of these frameworks represents a critical step in the refinement of EBPs and their implementation in these settings.

Kasari and Smith (2013) discuss several strategies to bridge the research-to-practice gap in school-based autism intervention. They base their recommendations on the Consolidated Framework for Advancing Implementation Science (CFIR) developed by Damschroder et al. (2009), focusing on three areas: the characteristics of intervention, context, and process. For example, they suggest what they refer to as “partial effectiveness trials” (p. 8) to address the gap that results from the differences between experimental and controlled settings in relation to the assessment of intervention efficacy. This strategy involves testing interventions in the school context before they are delivered to teachers. Kasari and Smith (2013) also recommend utilising Community-Partnered Participatory Research (CPPR) to facilitate the participation of end users throughout all implementation stages. Finally, they advocate for tailored teaching practices that align with the school context and the individualised needs of students with autism. These recommendations reflect the principles embedded in various IS frameworks in that they locate teachers' and students’ needs at the core of implementation processes.

Similarly, Guldberg (2017) has expressed concern about what she refers to as the “ideal” conditions or setting for assessing treatment efficacy. She encourages participatory designs and "move towards research designs that enable stakeholders to participate in identifying the outcomes to focus on and to contribute data from the classroom" (p. 157). Moreover, Odom et al. (2020) discussed the potential benefits of combining the disciplines of implementation science (IS) and Organisational Behaviour Management (OBM) to address

the research-to-practice gap in autism education. In relation to IS, they suggest the use of a comprehensive framework, such as the EPIS (Aarons et al., 2011) and NIRN (Fixsen, 2005). The EPIS was introduced with the primary aim of identifying factors that influence implementation, and has been successfully employed in various educational settings; for example, to promote the use of pivotal response training. The NIRN framework, on the other hand, was developed as an implementation driver and had previously been used to support the widespread adoption of EBPs by teachers of students with autism.

Odom et al. (2020) also discuss Organisational Behaviour Management (OBM), a subfield of Applied Behaviour Analysis (ABA), as a potential source of methods for improving the performance of behavioural researchers and teachers who work with students with autism. They suggest that OBM, which draws on ABA principles, could serve as a support system to provide coaching, monitoring and feedback for educators and behaviour analysts. Overall, Odom et al. (2020) argue that the integration of IS and OBM frameworks, methods and tools has the potential to bridge the research-to-practice gap in autism education by supporting and reinforcing the use of data-driven teaching practices and improving treatment fidelity.

A recent scoping review by Lee et al. (2025) represented the first published synthesis of IS frameworks used in autism educational research. The review provided information about the context, design and aims of the selected studies, the implementation framework employed, and the extent to which these implementation studies aligned with the phases of the autism implementation framework proposed by Boyd et al. (2022). The authors mapped the literature on autism studies that used IS frameworks by following the five-stage methodology developed by Arksey and O'malley (2005). To identify potential studies, a comprehensive search was conducted using four major databases and four registries.

The initial inclusion criteria were limited to articles that had been published in peer-reviewed journals over the last 20 years and which reported utilisation of an IS framework as well as intervention outcomes. Initial screening of 618 research studies yielded only 24 articles, which were examined further. Of these, 11 were excluded, leaving 13 that satisfied the inclusion criteria and were reviewed in detail. Table 2.6 summarises these 13 reports, based on information from the scoping review and a critical review of the original studies. The summary includes information on the aims of the studies, the IS framework they employed, and their alignment with the Autism Implementation Framework proposed by Boyd et al. (2022).

Table 2.6

Overview of 13 Studies Employing IS Frameworks in Autism Educational Research

IS Framework	Studies Included in the Scoping Review	Aim of the Study	Alignment with Boyd et al. (2022) Implementation Framework*
Exploration, Preparation, Implementation, Sustainment (EPIS) framework (Aarons et al. (2011)	Brookman-Frazee et al. (2020)	To examine factors that may inhibit or support the implementation of two EBPs aimed at reducing undesired behaviours and improving communication skills in children with autism within mental health and education settings.	Phase 1, Phase 2 and Phase 6
	Stadnick et al. (2022)	To evaluate the feasibility and accessibility of a tailored intervention model designed to link children with autism to suitable mental health services.	Phase 4
	Suhrheinrich et al. (2022)	To assess attitudes and knowledge of EBPs as well as treatment fidelity in two groups of providers (trained and untrained).	Phase 2 and Phase 6

	Suhrheinrich, Rieth, et al. (2020)	To facilitate the adaptation of Pivotal Response Teaching in the classroom for students with autism and assess the internal and organisational factors that impact implementation outcomes.	Phase 3, Phase 4 and Phase 5
	Suhrheinrich, Schetter, et al. (2020)	To expand the use of EBPs through various discrete implementation strategies, such as sharing educational material and resources, building partnerships and networking, training teachers and determining barriers and facilitators for successful and sustainable adoption and implementation of EBPs.	Phase 5 and Phase 6
Reach, Efficacy, Adoption, Implementation and Maintenance framework (RE-AIM) (Glasgow et al. (1999)	Anderson et al. (2021)	To explore and assess a modular approach to tailoring a flexible intervention that addresses implementation barriers and seeks to improve the development outcomes of students with autism in educational contexts.	Phase 1, Phase 2 and Phase 4

	Martin et al. (2023)	To test the feasibility of the Modular Approach and identify early signs of effectiveness for numerous autism interventions used in the school context. The results were expected to provide a foundation for future large-scale research studies.	Phase 1 and Phase 4
CFIR framework (Damschroder et al. (2009)	Azad et al. (2021)	To evaluate a creative program called “Partners in School” designed to increase the implementation of EBPs by ensuring alignment across home and school settings, and to explore factors associated with successful adoption and collaboration between parents and teachers.	Phase 1 and Phase 2
	Ruble et al. (2019)	To modify and implement an evidence-based consultation intervention, COMPASS, to meet the needs of transition-age youth with autism. This study also explored the internal and external barriers and sought to make the intervention program more acceptable to and adaptable by stakeholders.	Phase 3

Implementation Outcome framework (Proctor et al. (2011)	Locke et al. (2019)	To examine the most effective way to implement the "Remaking Recess" training program to determine the best method for enhancing peer engagement and social networking for children with autism.	Phase 2
Discover, Design, Build and Test framework (DDBT) (Lyon et al. (2019)	Bearss et al. (2022)	To re-design an intervention program (RUBI) originally developed for parents to address the disruptive behaviour of children with autism. Working collaboratively with school staff, the researchers identified necessary changes and created a tailored intervention that aligned with the school environment.	Phase 3 and Phase 5
Ecological Public Health model (Atkins et al. (2016)	Shire et al. (2022)	To compare and test different coaching methods and follow-up support systems intended to identify techniques for enhancing the implementation of the iJASPER intervention for young children with autism in community-based settings.	Phase 1

Fidelity of Implementation framework (Dunst et al. (2013)	(Ruble et al., 2013)	To examine the efficacy of the COMPASS intervention in improving independent skills as well as social and communication skills. The secondary goal of this study was to compare face-to-face with web-based programs to train teachers of children with autism.	Phase 3 and Phase 4

*In Boyd et al.'s (2022) framework, Phase 1 refers to community-partnered exploration, Phase 2 to planning and preparation, Phase 3 to acquiring resources, Phase 4 to initial implementation, Phase 5 to larger-scale implementation, and Phase 6 to sustainment.

This scoping review by Lee et al. (2025) represents a significant contribution to better understanding both current progress and critical gaps in the use of IS frameworks in autism intervention research. Employing Boyd et al. (2022) autism-specific framework as an analytical lens for evaluating the procedures and scope of the 13 studies, the authors provide numerous examples of the successful use of IS strategies in relation to training, coaching, examining treatment fidelity, and redesigning autism interventions for contextual adaptation. They argue that, while many recent initiatives aimed at bridging the research-to-practice gap in autism education have benefited from IS frameworks and strategies, the usefulness of IS in autism intervention research remains largely unexplored.

The scoping review makes many recommendations to improve the utilisation of IS frameworks in autism intervention research. For example, future research in autism education should attempt to examine the IS farmwork and methods in various community-based settings. The authors also recommend employing strategies aimed at targeting large-scale implementation and sustainment outcomes. Finally, the authors highlight the need to bridge the gap for specific populations, noting that it "particularly impacts marginalised communities, where access to and quality of services are often inferior" (p. 1). The current study, therefore, took the initiative to examine and introduce the KTA framework (Graham et al., 2006) in autism educational settings, with a particular focus on the Saudi Arabian context, where autism research and educational services are limited and under-resourced (Alnemary et al., 2017; Kelly et al., 2024; Kelly et al., 2016; Sulaimani & Gut, 2019)

2.7 Summary

This chapter has covered a wide range of topics. It has explored the influence of the introduction of autism diagnostic criteria in the DSM, described the increased prevalence of autism and the resulting pressure on schools to provide appropriate educational interventions, and examined the research efforts directed toward discovering educational interventions for

students with autism. This included an account of the early initiatives undertaken by prominent researchers, who laid the groundwork for others to follow. This was followed by a detailed discussion of a series of research endeavours aiming to identify EBPs for individuals diagnosed with autism, which involved a gradual move toward the use of diverse research methodologies, including SSD, to identify EBPs for autism education. Since it was not feasible to include all systematic reviews of EBPs, this section concentrated on seminal reports that not only contributed to the identification of EBPs but also helped to advance the employment of rigorous scientific methods for evaluating research on autism EBPs.

Moreover, the final section provides examples of the IS theories, models, and frameworks that have been most frequently used in autism intervention research. It does not claim to be an exhaustive account of IS frameworks and theories. Rather, the intention was to illustrate their usefulness in bridging the research-to-practice gap. Moreover, the identification of categories of IS theories and frameworks does not imply the existence of rigid boundaries between them; they merely serve a heuristic purpose (Nilsen, 2015). The integration of IS frameworks into autism intervention research remains in its early stages (Lee et al., 2025). Further work is needed to integrate these frameworks and assess their feasibility for developing robust guidelines for the future use of IS in autism educational research. The current study presents an example of the application of IS frameworks with the aim of bridging the research-to-practice gap in autism education in Saudi Arabia. Details of the study's research design, methods, and data analysis, as well as the results of that analysis, are provided in the following chapters.

Chapter 3: Research Design and Overview of Quantitative Component

As previously noted, this study employed a mixed methods design to investigate different research questions. Quantitative methods were used to investigate (1) how teachers of students with autism in Saudi Arabia rate their knowledge and use of various teaching practices, and (2) the influence of demographic characteristics on reported knowledge and practices. In addition, qualitative methods were employed to identify factors that either hindered or facilitated the adoption and implementation of Evidence-Based Practices (EBPs) in educational settings.

This chapter begins with a discussion of the rationale for a mixed-methods design and the procedures used to integrate the quantitative and qualitative findings. This is followed by a section on ethical considerations, including ethical approval, informed consent, and the voluntary nature of participation. The final section describes the quantitative component of the study, including research design, sampling and recruitment, method of data collection and research instrument.

3.1 Research Design

Diverse reasons for employing mixed methods have been introduced in the literature (Creswell & Clark, 2017; Dawadi et al., 2021; Flynn & Waterhouse, 2021). One of the main reasons and expected uses of mixed design is to obtain greater validity of research findings (Creswell & Clark, 2017). Overall, the use of mixed methods, such as a survey followed by an in-depth qualitative investigation, provides richer and more comprehensive data (Dawadi et al., 2021). A mixed-method design also increases the reliability of the findings through its ability to "reflect an iterative process of data collection and analysis that involves both inductive and deductive approaches to understanding complex phenomena" (Palinkas & Cooper, 2017, p. 348).

Specifically, this study employed an exploratory sequential mixed-method design to address the various components of the inquiry by ensuring congruence between research questions and methods (Alexander et al., 2008; Creswell & Clark, 2017). The two components are briefly summarised below.

A quantitative self-report survey was deemed suitable for answering the first research question: How do teachers of students with autism in Saudi Arabia rate their knowledge and use of evidence-based, emerging and unsupported practices? and its sub-question**:** How do demographic factors such as gender, years of experience, and employment sector relate to the reported knowledge and use of evidence-based, emerging and unsupported practices?

The second stage of the study focused on understanding contextual barriers to and facilitators of the adoption of EBPs in educational settings. A qualitative method was used to gain insight into the perspectives of Saudi teachers who work in both private and public schools. Focus group discussions were conducted to explore the school, societal and personal factors that influence teachers' adoption of EBPs, in order to answer the following two questions: What do teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs? and What strategies do teachers of students with autism in Saudi Arabia recommend for supporting the implementation of EBPs?

The coherence or rigour of any study is strongly related to the degree of consistency between the theoretical and methodological approaches (Creswell & Clark, 2017). In the present context, implementation science (IS) theories, frameworks and models informed the study design, ensuring that careful attention was paid to multilevel influences, iterative processes to address multi-faceted components, and contextual factors. Both qualitative and quantitative methods have been deployed in IS research to address these considerations (Bauer et al., 2015; Palinkas & Cooper, 2017; Palinkas et al., 2015). A review of funding

trends for implementation science grants by the National Cancer Institute from 2000 to 2012 found 69% of total grant proposals utilised a mixed-methods design (Neta et al., 2015).

3.1.1 Mixed Method for Implementing the KTA Framework

The selected theoretical framework of this study played a significant role and performed as a "navigational device" (Evans et al., 2011, p. 289) to guide the choice of appropriate methods. The decision to use a mixed-methods approach in this study was made following a review of existing studies that employ the KTA framework.

A review of recent research employing the KTA framework in the health science field reported that most studies had adopted a mixed-methods design (Chong et al., 2024; Torres et al., 2023). Similarly, Field et al. (2014) indicate that a mixed-methods design was the common approach in the literature among studies that employed the KTA framework. For example, investigations of the first phase of the KTA have employed a curriculum audit (Stacey et al., 2009), literature reviews (Claude et al., 2012; Molfenter et al., 2009), focus groups (Keyser, 2010) and a survey (Russell et al., 2010) to identify end users' needs. However, contextual barriers and facilitators of EBPs among end-users have mainly been investigated through qualitative methods, including focus groups, interviews, and group discussions (Claude et al., 2012; Molfenter et al., 2009; Petzold et al., 2010; Tugwell et al., 2007). The same phase of KTA can also be investigated using quantitative and/or qualitative methods as appropriate (Field et al., 2014). In other words, a mixed-methods design is ideally suited to investigate multiple phases and answer different research questions within a single study.

In the context of autism research, Luskin-Saxby and Paynter (2018) recommend using a systematic examination of the literature to identify end users' needs in phase one of the KTA action cycle and employing interviews and surveys to assess potential barriers to knowledge use. The mixed method design was explicitly suggested by the authors to be

utilised across all phases, and occasionally within a single phase of the KTA framework. Likewise, Boyd et al. (2022) outlined various activities and strategies that could be categorised under qualitative and quantitative approaches.

3.1.2 Integration of Quantitative and Qualitative Methods

The current study employed a combination of quantitative and qualitative research methods to gain a more comprehensive understanding of the various issues encompassed by multiple research questions. Quantitative methods provide numerical precision, which allows for the identification of trends and comparisons. Whereas the data generated by qualitative methods provides contextual understanding and deeper insight into participants' viewpoints and experiences. The following discussion examines the relationship between these two types of methods based on the criteria identified by Creswell and Clark (2017), namely, "the level of integration, priority, timing, and mixing" (p. 68). These authors' criteria are summarised below.

Type of Connection. The level of interaction between the methods is one of the most important considerations in a mixed-methods study. Two types of relationships can be formed between quantitative and qualitative methods: interactive and independent. The interactive relationship requires a direct mix or integration of the methods at some point before the final interpretation and during the early stages, such as the design of procedures or during the data collection stage. A significant feature of the interactive relationship is that one method can direct and may affect the other method by converting data or relying on the results of one to inform the design and development of the other.

In contrast, the independent approach deals with each research method separately throughout the procedures of data collection and analysis, and data integration only occurs during the interpretation stage. This was the approach adopted in the present study, since the research questions differed in nature and focus. Accordingly, the findings from the

quantitative and qualitative stages are presented in two separate chapters, followed by an integrated discussion that combines the two to present a comprehensive and nuanced understanding of factors influencing Saudi teachers' adoption of EBPs in education settings.

Emphasis and Priority. According to Creswell and Clark (2017), mixed-methods studies commonly place greater weight on one type of data over the other. The decision to prioritise qualitative or quantitative data is not arbitrary. However, it is based on the number and type of questions being asked and the extent to which generalisation of findings is desired. In this study, however, the quantitative and qualitative data share equal significance and contribute collectively to the overall study aim while addressing separate research questions. Specifically, the issues suggested by the first phase of the KTA framework were addressed using a quantitative rating scale, while data that aligned with the second and third phases of the KTA framework were collected using the qualitative method of focus group discussions.

Temporal Relationship. Timing is another aspect that must be considered when employing a mixed-methods design. Creswell and Clark (2017) define timing as "the temporal relationship between the quantitative and qualitative strands within a study" (p. 65). Timing goes beyond merely determining when data collection occurs. It includes all other processes of integration, analysis and reporting to holistically inform the research questions. When employing mixed methods, researchers may follow one of three timing types: sequential, concurrent or multi-stage design. In this study, focus group participants completed the survey prior to attending the meeting, thereby following a sequential design. However, the processes were concurrent for the remainder of the research sample and those who only participated in the survey. When viewing all participants across the entire study, the survey was collected before, during, and after the focus group meetings.

Point of Interface. The point of interface involves "drawing conclusions or inferences that reflect what was learned from the combination of results from the two strands of the study, such as by comparing or synthesising the results in a discussion" (Creswell & Clark, 2017, p. 67). In the present study, this point occurred at the interpretation stage. The two stages of this study were conducted independently, with clear timelines and procedures. Although different procedures of data collection and analysis were implemented in each stage, both were directed toward achieving the overall goal of the study. This was to provide policymakers with previously unavailable information that can help to increase the adoption of EBPs by teachers of students with autism.

3.2 Ethical Considerations and Procedures

Human research always carries potential risks, and qualitative research in particular may expose research participants to greater risk (Brinkmann & Kvale, 2005; Orb et al., 2001). Ethical considerations are particularly important in the context of focus group discussions (Morgan & Hoffman, 2018a). This is because focus groups involve dynamic interactions between the moderators and the participants and among the participants themselves, thereby presenting potential challenges to confidentiality (Plummer-D'Amato, 2008). Quantitative methods such as surveys carry less risk because responses are anonymous, but their implementation still requires ethical review. The process of obtaining ethical approval and the procedures adopted to ensure adherence to ethical principles are described in detail below.

The study design was informed by The University of Sydney's Research Code of Conduct (2019) and the Australian Code for Responsible Conduct of Research (2018). The study was approved by the University's Human Research Ethics Committee (HREC) [Protocol 2023/174], as documented in Appendix A.

As this study took place in Saudi Arabia, ethical approval was also required from the Agency for Planning and Development (APD) in the Saudi Ministry of Education. The committee requested translated versions of the HREC approval document, participant information and consent forms, survey items and focus group questions, and a summary of the research aims and data collection procedures. The APD reviewed the documents, and the researcher was granted permission to conduct the study at government and private schools registered with the Saudi Arabian Ministry of Education (Appendix B). Following Ministry approval, the researcher sent an invitation email to eligible schools (Appendix C). Schools whose teachers expressed their willingness to participate in the survey or the focus group were sent copies of the Participant Information Statement (PIS), which provided more detailed information about the purpose of the study, the researchers, and what would be expected from participants and researchers, as elaborated below.

Different PIS forms were created for the survey (Appendix D) and the focus group discussions (Appendix E). The latter was disseminated in print or sent electronically to schools, where they were shared with teachers by administration staff or school coordinators. Teachers who agreed to participate in the focus group study were later asked to read and sign a Participant Consent Form (Appendix F). Written consent was only required from focus group participants. The relevant PIS was displayed on the survey's landing page, followed by a mandatory consent question; participants could not move on with the survey without providing consent. The PCF and PIS forms were first developed and written in English in accordance with the HREC requirements. These documents were subsequently translated into Arabic and certified by a specialised English translation agency (Appendix G).

Survey participants could withdraw their responses prior to submission, but not thereafter due to the anonymity requirement. Participants in the focus group were free to stop and leave at any time during the meeting or to decline to answer any of the questions. They

were advised that it may not be feasible to remove a comment once the meeting had concluded, as the sessions were audio-recorded in a group setting. However, they could subsequently request that their contribution be excluded from the data analysis and reporting.

The researcher has years of experience working with teachers and a deep understanding of the broader social context in Saudi Arabia. However, various precautions were taken to prevent or deal with the potential for discomfort or harm, which is of particular importance in qualitative research. Accordingly, a detailed distress protocol, 12 scenarios across multiple stages (Appendix H), was developed for use during data collection (Whitney & Evered, 2022). However, the researcher did not encounter any situation where the distress protocol needed to be applied.

3.3 Overview of the Quantitative Component

Quantitative methodology was employed to assess current needs, which is crucial for understanding the scope and nature of any existing knowledge gaps (Kitson & Straus, 2010). In this case, quantitative data were collected using a survey to assess teachers' self-perceived knowledge and use of evidence-based, emerging and unsupported practices. More specifically, this part of the investigation aimed to determine which teaching practices are most and least commonly known and used by teachers of students with autism in Saudi Arabia. Accordingly, data were collected using an ordinal 5-point scale to quantify teachers' self-evaluation responses. While identifying the general level of knowledge and use of teaching practices was the main goal, quantitative data also allowed for comparisons among groups in order to identify patterns that might demonstrate the influence of demographic characteristics on teachers' reported knowledge and use.

Quantitative methodologies enhance the potential of research findings to be generalisable and replicable (Roever & Phakiti, 2017). Numerical data enable the application of diverse statistical methods to reveal patterns and identify relationships between broad

datasets (John, 2010; Schutt, 2019). However, quantitative methods also have limitations. For instance, they cannot provide a contextual understanding of the discovered pattern or the causal factor in relationships, and have been criticised as reductionist (Stockemer et al., 2019): “not all research is quantifiable. Some phenomena, such as individual identities or ideologies are difficult to reduce to numbers” (p. 9). The ‘superiority’ of one methodology over the other has been widely discussed. Many argue, however, that both methods have strengths and weaknesses and should be valued in relation to their shared aims and processes (Casebeer & Verhoef, 1997; Gelo et al., 2008).

Several considerations led to the selection of a quantitative method to identify teachers' knowledge and use of EBPs. The quantitative method aligned with the aim of the first research question, which was to determine teachers' knowledge and use of evidence-based, emerging and unsupported practices. Moreover, Stockemer and Bordeleau (2023) point out that “quantitative methods not only allow us to numerically describe phenomena, but they also help us determine relationships between two or more variables” (p. 8). The application of statistical techniques of analysis to the survey data enabled an investigation of the relationships between the reported knowledge and use of the three teaching practice categories and some demographic characteristics of teachers.

Quantitative methodology is particularly suitable when a researcher wishes to recruit a relatively large study sample (Stockemer & Bordeleau, 2023). Numerical data obtained from a survey allow the study to be replicated and the results generalised beyond the original sample. In this particular investigation, the time and resource constraints inherent in PhD research further supported the argument for the use of a survey, since it allows large-scale data to be gathered efficiently. Finally, the decision to particularly employ the quantitative survey method was also a result of reviewing considerable literature (Alatifi et al., 2023;

Alghamdi, 2021a; Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015) that utilises similar research methods to investigate comparable research questions.

3.4 Quantitative Research Design

According to Grove and Gray (2018), quantitative research is "a formal, objective, rigorous, and systematic process for generating numerical information about the world" (p. 30). They identify various quantitative research designs, including experimental, quasi-experimental and non-experimental, and correlational, comparative and descriptive designs. Although each quantitative design possesses advantages and limitations, experimental design is perceived as the "most powerful quantitative method because of the rigorous control of variables" (Grove & Gray, 2018, p. 32). The quasi-experimental design, on the other hand, lacks the ability to randomise but still shares similar features with the experimental design in that both involve the manipulation of an independent variable (Bloomfield & Fisher, 2019; Burkholder et al., 2019).

In contrast, a correlational design is considered a non-experimental research method, and variables are not manipulated. Correlation design aims to measure the existence, strength, and direction of a relationship between two or more research variables (Bloomfield & Fisher, 2019). On the other hand, descriptive design has no control over research variables and does not aim to manipulate them. Instead, the descriptive design focuses on systematically examining the variables of a single research sample in a real-life setting (Bloomfield & Fisher, 2019).

In this study, a descriptive, quantitative, non-experimental design was employed. This type of design has been frequently used to measure the knowledge and teaching practices (evidence-based, merging and unsupported) of teachers of students with autism (e.g., Alatifi et al., 2023; Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015; Sulek et al., 2019). Surveys are the primary tools used in descriptive quantitative design for many reasons,

including (but not limited to) their ability to provide a narrative depiction of patterns, frequencies and trends in the data (Grove & Gray, 2018), along with their cost-effectiveness, anonymity and versatility (Kang & Hwang, 2023; Nayak & Narayan, 2019).

A descriptive quantitative design was also suitable for investigating the influence of teachers' demographic characteristics on their reported knowledge and practices. The present study can be categorised as a comparative descriptive design, which involves the comparison of variables in two or more groups. The overall rationale for conducting a comparison of subgroups in this study is consistent with the IS theoretical frameworks and theories, which emphasise the importance of identifying end users' needs and tailoring support according to their unique characteristics (Fixsen, 2005; Graham et al., 2006; Kitson & Straus, 2010). This study adopted an exploratory research method where no hypotheses were formulated. Instead, a set of research questions was developed for inductive exploration. One of these questions involved an examination of potential differences among teachers across gender and school type, for the reasons discussed below.

Worldwide, the educational landscape varies significantly. The Saudi Arabian school system differs in important ways from its Western counterparts (Kelly et al., 2024; Olsen & Kelly, 2020). The most obvious difference is the division of the Saudi educational system into two independent streams that operate in parallel under the Ministry of Education, one for male students taught by male teachers and the other for female students taught by female teachers in separate school settings (Alnahdi & Schwab, 2023). This structural separation generates two distinct environments in which teachers are exposed to different information resources, peers and school climates and, therefore, require different support systems and training opportunities.

Yet very few studies in Saudi Arabia have used similar independent variables to compare these two groups. The literature review for the present study identified only one study

(Alhossein, 2021) that compared EBPs' knowledge and use by gender; the findings revealed a higher level of knowledge and frequency of use among female teachers. Accordingly, the results of the gender comparison in this thesis will make a significant original contribution to the limited database in Saudi Arabia. The inclusion of gender as a variable is further justified by evidence from studies based on Social Role Theory, which document gendered differences in roles, socialisation and expectations (Eagly & Wood, 2012; Leaper, 2015).

The type of school (public or private) is another variable that has been shown to influence both teachers' performance and students' academic achievement (Claes & Moulin, 2026). Maash (2021) specifically highlights the need for comparative research in both educational sectors to provide relevant data in the Saudi context, in which public and private schools differ in relation to their funding source, administrative philosophy and institutional context (Yas et al., 2024). While the private sector is independently funded, the Saudi government is responsible for funding public schools, which provide free education for all citizens and residents (Maash, 2021). This differential funding means that government schools carry a greater financial burden than their private counterparts, which is reflected in disparities in school infrastructure, information resources, and budgets for professional development, all of which are likely to impact the successful adoption and implementation of EBPs.

In addition to the different working conditions in the two sectors, there are differences between teachers in relation to qualifications, financial benefits and even nationality (Maash, 2021). For instance, the teaching workforce in public schools is restricted to Saudi citizens, whereas private schools tend to recruit teachers from other Arab countries as well as a small number of Saudis who have been unable to join the public sector. In addition, the families who fund the private sector can exert pressure on schools to monitor teachers' performance and achieve better academic results. On the other hand, teachers in public schools' face difficulties with bureaucratic procedures and resistance to educational reform (Maash, 2021).

Accordingly, gender and school type were included as variables in the present study to generate currently unavailable comparative data that can inform recommendations to support the adoption and implementation of EBPs in autism education across the Saudi educational landscape.

In summary, this study employed descriptive and comparative designs to investigate the level of knowledge and frequency of use across teaching practices within three categories, and to make comparisons based on demographic factors without attempting to establish causality.

3.4.1 Sampling and Recruitment

Sampling techniques in all types of scientific research can directly influence the integrity and quality of the research outcomes (Delice, 2010). Sampling is a method used "to systematically select a relatively smaller number of representative items or individuals (a subset) from a pre-defined population to serve as subjects (data source) for observation or experimentation" (Sharma, 2017, p. 749). A clear description of sampling procedures, sample size, and inclusion and exclusion criteria is essential for research replication (Delice, 2010). Numerous factors play a role in sampling decisions, including the overall aim, timeframe and resources, research context and scope, and the availability of a sampling list (Sarker & AL-Muaalemi, 2022).

In this study, a purposive sampling technique was employed to select a group of cases who share similar characteristics, that is, teachers working under the Ministry of Education in schools in Saudi Arabia and providing educational services for students with autism. Although the recruitment of survey participants was based on predetermined purposive sampling criteria, the procedure can also be classified as self-selected sampling, since participation becomes voluntary after the invitation is received (Sharma, 2017). Purposive

sampling is widely used to collect quantitative data in social science research (Rowley, 2014; as cited in Sarker & AL-Muaalemi, 2022).

Stockemer and Bordeleau (2023) define the research population as “the entire group of subjects the researcher wants information on” (p. 59). This study collected quantitative data through an online survey distributed to teachers of students with autism. Schools in different administrative regions in Saudi Arabia received an invitation, which they were asked to share with relevant teachers. The survey was distributed to more than 40 schools with autism educational programs; however, it was not possible to determine the total population of such schools due to the unavailability of data. The target population comprised male and female teachers aged 22 to 60 years who worked in separate educational systems (single-gender schools) across various educational stages and settings, and who met additional inclusion requirements, namely, holding a bachelor's degree or certificate in the educational field and currently employed full or part-time in public or private schools in Saudi Arabia. Although not classified under the traditional teacher’s category, behavioural analysts were also eligible to participate because they provided educational interventions for students with autism and met other inclusion criteria. On the other hand, administrative staff, social workers and healthcare staff were excluded from participation.

Participants were recruited in three consecutive stages. The researcher initially provided a copy of the survey to be reviewed by the Office of Planning and Development (OPD) in the educational department in Al-Hasa, Saudi Arabia. After obtaining approval from the OPD to distribute the survey, the researcher shared a Qualtrics-generated link and barcode with the OPD, who took responsibility for sharing it with special education programs in various schools in Al-Hasa City. The researcher did not directly contact school administrations or special education teachers at this stage. Although this continued for one

month, no responses were received. Therefore, various initiatives were implemented to enhance the response rate.

The researcher arrived in Saudi Arabia on a research trip and visited the OPD, subsequently being provided with a list of schools specialising in educating students with autism, along with their contact details. An invitation email was sent to each school Principal explaining the study aims and procedures. The email contained a link and a barcode to access the online survey. Several schools offered an opportunity for the researcher to personally meet with dozens of teachers to invite them to respond to the survey. During these meetings, the researcher explained the structure of the survey and the time needed to complete it, shared a brief video demonstrating how to fill it out, and assured potential participants that no personal information would be collected. The school visits were limited to male schools, as males are not allowed to access exclusively female schools in Saudi Arabia. These on-site meetings provided an opportunity to create valuable relationships with male teachers, which facilitated subsequent recruitment for the focus group meetings. Most male teachers who participated in focus group discussions had previously completed the survey.

The third stage of recruitment for the survey began when only a small number of responses were being received daily. The survey was then distributed to additional schools located in various regions in Saudi Arabia. Expanding the survey to other cities in Saudi Arabia required further approval from the Ministry of Education, which took several additional weeks. As in the previous stage, the OPD in the education department for each region then disseminated the survey to the identified schools. The survey was available for several months after the research trip ended. The researcher did not make any school visits at this stage due to limited time and financial resources, relying on the school administration to encourage teachers' participation. Lastly, teachers who participated in the survey did not receive any incentives or compensation.

3.5 Research Instrument

The use of surveys to obtain different sorts of information about individuals has become one of the most widely accepted and frequently used research methods (Stockemer & Bordeleau, 2023). This study used the cross-sectional survey method to collect numerical data about teachers' knowledge and use of various teaching practices. A cross-sectional study design is used to collect data about the phenomenon under investigation at a single point in time, in contrast to a longitudinal design in which data are collected on multiple occasions over time (Kesmodel, 2018; Stockemer & Bordeleau, 2023).

The Early Intervention Practices Scale (Paynter et al., 2017) was modified and used to measure teachers' knowledge and use of evidence-based, emerging and unsupported practices (Appendix I). This scale was initially administered in a study investigating knowledge, use, and attitude toward EBPs and other related practices among Australian staff members working in early intervention services for children with autism (Paynter & Keen, 2015). The original scale included a comprehensive list of 40 practices distributed into three teaching categories: EBPs (24), emerging (six), and unsupported (10). The practices are listed alphabetically in the vertical direction, while the horizontal side contains a five-point scale ranging from 0 to 4, where 0 = knows very little or nothing, to 4 = knows a great deal. A five-point rating scale was also employed to evaluate the level of use, with response options ranging from 0 = never uses this practice, to 4 = frequently uses this practice (i.e., more than once a day). Each teaching practice presented in the scale is accompanied by a brief definition of its meaning. For example, modelling, one of the EBP categories, is defined as the demonstration of a desired behaviour with the aim of teaching it through imitation.

The original Early Intervention Practices Scale (Paynter et al., 2015) was updated (Paynter et al., 2017) to allow the incorporation of later research evidence supporting the use of new teaching practices or indicating the need for reclassification. For example, an

emerging teaching practice could be classified as EBP if research supports its effectiveness and it meets the minimum evidence criteria. The first version of the scale was developed based on available literature on EBPs (Green et al., 2006; NAC, 2009; Odom et al., 2010), while the revised version benefited from subsequent autism educational literature (Wong et al., 2015). The revised version of the survey lists 44 teaching practices: EBPs or established (24), emerging (six), and unsupported teaching practices (10). As well as adding four additional teaching practices to the established/EBP category, the changes also involved redistributing some practices across and between teaching categories.

3.5.1 Revision and Modification of the Scale

The scale used in the present study underwent further revision to reflect the emergence of research evidence indicating the need to add or re-categorise several autism educational practices. The adapted version is based on the work of Hume et al. (2021) and Steinbrenner et al. (2020), who undertook a third-generation systemic review that led to the recognition of new EBPs and a re-assessment of those identified by Wong et al. (2015). In Table 3.1, the first column lists the items in the established/EBP category as introduced in the revised scale (Paynter et al., 2017). The second column presents the updated list of EBPs that was used in our survey. It explains and justifies the decision to maintain, remove or modify the previously established categories.

Table 3.1

The Updated List of EBPs and Decisions Based on the Most Recent Systematic Review

EBPs as listed by Paynter et al. (2017)	Decision based on Steinbrenner et al. (2020)
1. Antecedent-based Interventions 2. Differential Reinforcement	Maintained; supported by sufficient evidence, and confirmed by further research.
3. Discrete Trial Teaching	Maintained; renamed Discrete Trial Training

4. Exercise	Minor modification; renamed Exercise and Movements to include fine and gross motor skills, as well as mindful movement.
5. Extinction 6. Functional Behavioural Assessment 7. Functional Communication Training	Maintained; supported by sufficient evidence.
8. Joint Attention Intervention	Removed; it is not regarded as an EBP but as an educational outcome.
9. Modelling 10. Naturalistic Intervention 11. Parent-implemented Intervention	Maintained; supported by sufficient evidence, and confirmed by further research.
12. Peer-mediated Instruction/Intervention	Renamed Peer-Based Instruction and Intervention, and now includes Structured Play Groups.
13. Picture Exchange Communication System (PECS)	Merged into a new teaching category. Augmentative and Alternative Communication.
14. Pivotal Response Training (PRT) 15. Prompting 16. Reinforcement 17. Response Interruption/ Redirection	Merged into Naturalistic Intervention. Maintained; supported by sufficient evidence, and confirmed by further research.
18. Scripting	Merged into Visual Support; Scripting is no longer considered an independent established practice.
19. Self-management	Maintained; supported by sufficient evidence, and confirmed by further research.

20. Social Narrative	Maintained; however, Social Stories © is now included within Social Narrative.
21. Social Skills Training	Maintained; supported by sufficient evidence, and confirmed by further research.
22. Speech-generating Devices and Alternative and Augmentative Communication	Minor modification; renamed Augmentative and Alternative Communication (AAC).
23. Stimulus Control/ Environmental Modification	Removed; not mentioned in either of the more recent publications. It could be integrated into Antecedent-based Intervention
24. Task Analysis 25. Technology-aided Instruction 26. Time Delay 27. Video Modelling 28. Visual Support	Maintained; supported by sufficient evidence, and confirmed by further research.

Almost all items from the established/EBP category (Paynter et al., 2017) were retained, with some minor changes to reflect the most recent research. For example, the adapted scale used in this study completely removed two EBPs and merged three other teaching practices into existing EBPs (Hume et al., 2021; Steinbrenner et al., 2020), allowing for the inclusion of five additional teaching practices as EBPs. These teaching practices were included in the survey used in this study, namely: (1) Behavioural Momentum Intervention, (2) Direct Instruction, (3) Music-mediated Intervention, (4) Cognitive Behavioural/ Instructional Strategies (CBIS), and (5) Sensory Integration.

The revised Early Intervention Practices Scale (Paynter et al., 2017) listed six emerging teaching practices. This category was the most significantly altered after comparing these practices against the newly available evidence (Hume et al., 2021; Steinbrenner et al., 2020). All six teaching practices were removed entirely from the emerging category of the survey. This was mainly because some emerging practices met the required level of evidence and were later classified as an EBP. For example, music therapy was classified as an emerging practice (Paynter et al., 2017). However, the latest review by Hume et al. (2021) re-examined research evidence related to Music-mediated Interventions (MMI) and found additional evidence to support the inclusion of this practice into the EBPs category. The MMI now includes not only music therapy but also other interventions that integrate music into academic and behavioural interventions. Similarly, the Independent Work Systems were merged into visual support, while the Sign Language Instruction was combined with Augmentative and Alternative Communication. Another thing to mention is that Theory of Mind Training, an emerging practice, is no longer considered an independent practice but, rather, an instructional outcome (Hume et al., 2021; Steinbrenner et al., 2020).

The survey included four emerging teaching practices and 11 practices with some supporting evidence of effectiveness. These four teaching practices were selected for inclusion because they are supported by some evidence (ranging from two to four supporting research studies) but lack sufficient research support to be classified as EBPs. These four emerging practices were: (1) Collaborative Coaching, (2) Exposure, (3) Matrix Training, and (4) Punishment.

The unsupported practice category was originally constructed by Paynter and Keen (2015) and was derived from literature on widely used teaching practices in autism education (Green et al., 2006; NAC, 2009). Even after the revision by Paynter et al. (2017) using different EBP reviews, such as Wong et al. (2015), the list of unsupported practices remained

unchanged, and all ten practices continue to lack research evidence support. In this study, a second revision was conducted using more recent EBP research reviews (Hume et al., 2021; Steinbrenner et al., 2020). The results were very similar, as no evidence has emerged to support reclassifying unsupported teaching practices into different categories. However, two unsupported practices were excluded from the survey employed in the present study. The first to be modified was Academic Intervention, which was defined as the use of traditional teaching methods to improve academic performance. Instead, Direct Instruction was introduced and classified as an EBP based on these two recent systematic reviews.

Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT) was listed by Paynter et al. (2017) as an unsupported teaching practice that is commonly used. The PROMPT method is defined as "a manualised tactile-kinesthetic approach that uses touch cues to a student's jaw, tongue and lips to manually guide the production of a target word" (Paynter et al., 2017, p. 179). PROMPT is a therapeutic approach employed mainly by speech-language pathologists to enhance speech and sounds. As this method is commonly utilised by speech-language pathologists, this practice was removed from the survey scale because it is not particularly relevant to teachers of students with autism. All remaining eight teaching practices were maintained in the unsupported category as there was no evidence to support their use otherwise. For example, Steinbrenner et al. (2020) conclude from their review that the Rapid Prompting Method (RPM), which has been used in teaching students with autism during the last 20 years, holds no promise for teaching efficacy.

In summary, this study used a modified version of the Early Intervention Practices Scale (Paynter et al., 2017). The researcher conducted a meticulous review of each teaching practice to ensure that the scale used in the current survey was updated to reflect the findings of the most recent EBP literature reviews (Hume et al., 2021; Steinbrenner et al., 2020).

3.5.2 Survey Design

Surveys can be conducted in four main ways: by telephone, face-to-face, by mail or online (Gürbüz, 2017; Stockemer & Bordeleau, 2023). Each has its advantages and disadvantages, but the selection of an appropriate mode is based on multiple factors, such as the type of demographics, budget availability, accessibility, and timeframe. As Evans and Mathur (2005) suggest, online surveys are convenient and offer flexibility in timing. The authors also contend that online surveys allow participants to respond at any time or place, with the option to pause and resume. They also note that the method offers extensive geographic reach, which allows a large sample to be obtained with minimum administrative effort and costs. Accordingly, this study employed an online survey using the Qualtrics platform because of its ability to reach geographically distant populations and its cost-effectiveness. The instrument is described in detail below.

3.5.2.1 Aim and Potential Outcomes

The study's self-report survey aimed to determine teachers' knowledge and use of evidence-based, emerging and unsupported practices. A self-report survey is easily and quickly administered, yet provides deep and valuable insight into the topic under investigation. In this study, the survey was designed to identify teachers' areas of strength and weakness and help to determine priorities for instructional support and training to support the implementation of EBPs in educational settings. A comparative analysis of data was conducted to investigate the demographic characteristics (gender, years of experience, and employment sector) on the reported knowledge and use of teaching practices. Gaining a greater understanding of the influence of teachers' demographic characteristics allows for future supporting initiatives to address demographic-related gaps or needs.

3.5.2.2 Components and Structure of the Survey

Welcome Page. The first section of the survey contained the title and an icon to select the preferred language (Arabic or English), followed by a statement of essential information, including the purpose of the survey, the importance of reading the PIS, and the process of indicating consent to participate by clicking the checkbox.

PIS Form and Consent. The full PIS appeared on the next page and responding to the consent question was mandatory. Participants could not proceed without providing their consent. If participants selected "Yes" and completed all items, their submission was interpreted as consent to participate in the study. It was also noted on the PIS form that withdrawal was only possible before submission; however, once a survey was submitted, the researcher could not identify or remove the completed survey response. A second conditional question, an inclusion and exclusion filter, was presented at the beginning of the survey. Respondents were allowed to proceed to the scale itself only if they were currently working at a school or educational institution that is a part of the Saudi Ministry of Education and provides teaching to students with autism.

Demographic Information. Participants were asked to provide information on their age group, degree attained, gender, and years of experience (Appendix J). Participants' names or their educational institutions were not requested to preserve the highest level of anonymity and privacy. All demographic questions were designed to be answered through multiple-choice questions with free-text options in some questions. All questions in this section were mandatory fields, and progress to the next page was contingent on completing all answers. The demographic information section was developed based on data and classifications provided by the Australian Bureau of Statistics (ABS). However, as this survey was planned to be conducted in Saudi Arabia, the researcher and supervisory team modified some questions to reflect local cultural norms. For example, due to the Saudi country's strict

interpretation of gender norms, gender options other than male and female were not included, since this is considered a violation of Saudi law and may be offensive to some respondents. These modifications were submitted to and approved by the Research Ethics Committee at The University of Sydney.

Rating Scale System. The ordinal Likert rating scale is one of the most frequently used in quantitative surveys (Stockemer & Bordeleau, 2023). An ordinal scale is suitable for assessing or measuring subjective experience (Roever & Phakiti, 2017). The user-friendly structure of an ordinal survey can facilitate a higher response rate and reduce the response burden (Kusmaryono et al., 2022). In the context of the present study, the original scale developed by Paynter and Keen (2015) used the ordinal Likert rating scale, and other related research adhered to the same format, which contributes to its validity through continued application. In this study, the format was adopted to obtain self-report data on participants' knowledge and use of evidence-based, emerging and unsupported practices in their teaching of students with autism.

Two different rating scales were used to rank the level of knowledge and frequency of use (Appendix K). Both were ordinal five-point scales ranging from 0 to 4, but the operational definition of each scale point differed. An explanation of the scale points was presented on a separate page before participants proceeded to the questions themselves. These were displayed again on the question page for those who might have needed to refer back to the operational definitions while ranking the teaching practices.

Core Questions. Teachers' knowledge and use of various teaching practices were evaluated via the Qualtrics survey tool. Two distinct 5-point type-response scales were employed to assess knowledge and frequency of use, respectively. The survey comprised 40 closed-ended questions/practices, classified into three categories: 28 evidence-based practices, four emerging practices, and eight unsupported practices. The survey began by

directing participants to read each item (teaching practice and its definition) and then self-evaluate their knowledge and use of each practice. The teaching practices were listed alphabetically, as suggested by Paynter et al. (2017), to avoid bias, and were written in bold to ensure visual clarity. The definitions of each teaching practice were presented in non-bold typeface below the title of each practice. To the left of each teaching practice, two rating scales were presented simultaneously: the knowledge scale followed by the use scale.

Additionally, all survey questions were displayed on a single long page. Participants scroll down to the next question instead of clicking "Next" after each response. The submit button was placed at the very end of the page. In addition, the forced completion feature was activated to allow submission for only completed responses. After submission, the “Thank You” page was displayed to show appreciation for participants’ time and effort, and an email address was provided for those who might have any enquiries or feel distressed.

3.5.3 Procedures of Delivery and Dissemination

This survey was designed and written in Microsoft Word and then transferred to be hosted on the Qualtrics platform. Qualtrics-generated links and barcodes were used to distribute invitations to participate. The Qualtrics platform was selected because of its user-friendly design, which allows the survey to be tailored to align with the research objectives and the characteristics of responders. Additionally, it integrates data easily into other data analysis software and adheres to the host university’s policy on data management and storage requirements. The platform offers many types of survey questions using complex logic displays with multi-language support. The multi-language feature includes support for right-to-left text, which was necessary for the Arabic text in this survey. However, the researcher also used a translated survey manually to ensure accuracy and avoid misinterpretation. The English-to-Arabic translation went through three steps: the researcher translated the survey

into Arabic; the translation was then approved by an Arabic-speaking professor specialising in Special Education; and the final text was certified by an independent translation agency.

3.6 Summary

This chapter began with a discussion of the mixed-methods approach and its suitability for addressing the research questions, along with a discussion of the relationship between the quantitative and qualitative components of the study. This was followed by a detailed description of the quantitative method used in the study, including sampling technique, selection and modification of the survey, components and structure of the survey, and the process of its dissemination. The methods and procedures of analysis of the quantitative data are explained in Chapter 5, where the results of this analysis are presented. The next chapter focuses on the qualitative component of the study, including research design and data collection procedures.

Chapter 4: Qualitative Component

This chapter details the collection of qualitative data from focus group discussions, including sampling, setting, content and procedures. It begins with an overview of the steps taken to ensure the quality of this component of the study.

Qualitative methods have been widely used in research investigating complex social contexts and human behaviours in various fields of study (Creswell & Poth, 2016). The methodological literature identifies a number of procedures involved in the preparation, implementation and reporting of qualitative research that can impact the quality of findings (Tong et al., 2007). These include the requirement to provide detailed descriptions of the research process in order to facilitate replicability and evaluation of transparency and trustworthiness (Oplatka, 2021).

Accordingly, the development of the research design for this study was preceded by a thorough review of the literature to identify appropriate conceptual frameworks and methods to guide the inquiry. Specific frameworks and methods emerged as particularly relevant to the study's aim and objectives. These theoretical frameworks and methods served different purposes. These include: identifying research pathway using the KTA framework (Graham et al., 2006), designing qualitative inquiries for focus group discussions using the ADAPT process model (Moore et al., 2021), the multilevel conceptual framework (Domitrovich et al., 2008), analysing qualitative data using reflexive thematic analysis (Braun & Clarke, 2022) and reporting research method using the Consolidated Criteria for Reporting Qualitative Research (COREQ; Tong et al., 2007).

The following section describes how the COREQ criteria informed the design and implementation of the qualitative component of the study, which addressed the following research questions:

- What do teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs?
- What strategies do teachers of students with autism in Saudi Arabia recommend for supporting the implementation of EBPs?

4.1 The COREQ Checklist

The COREQ (Tong et al., 2007) was developed to enhance the reporting of qualitative research. This includes "the rigour, comprehensiveness and credibility of interview and focus-group studies" (p. 350). From an extensive review of existing guidelines, the authors identified 76 items from 22 reviewed studies, which they refined and reduced to 32 items (Tong et al., 2007). In its final form, the 32-item checklist is organised into three main domains: Research Team and Reflexivity; Study Design; and Analysis and Findings. The COREQ checklist has been widely recognised for its standardisation and consistency, is cited extensively in multiple fields of study, and is a requirement for publication in many qualitative journals (Stenfors et al., 2020).

This section focuses on the first and second domains of the COREQ. The third domain (Data Analysis and Recording) is addressed in Chapter 6, which guides the reporting method of qualitative data analysis used and the results of this analysis. The second section explains the research design, including the methodological and theoretical orientation, selection and recruitment of participants, description of settings, and data collection procedures using the focus group method.

4.1.1 Research Team and Reflexivity: Constructivist Approach and Positionality

This domain is concerned with the characteristics of the researcher and her/his relationship with participants. This focus is informed by the theoretical framework of constructivism and the related concept of positionality, which are elaborated below. The second part of this chapter will provide an overview of the qualitative design. This includes

the methodological and theoretical orientation, selection and recruitment of participants. The readers will also be provided with a description of settings, data collection instruments and procedures.

4.1.1.1 Constructivist Approach

This study adopted the constructivist approach. The social constructivist approach is commonly associated with interpretivism. This approach adopts the idea that reality is formed through individuals' perceptions and interpretations as well as interactions with internal and external variables (Creswell & Poth, 2016). In social constructivism, the development of theory, the explanation of a phenomenon or even the generation of an essential meaning is inductively obtained.

This approach aligns with the aim of this component of the study, which was to explore what teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs. Because it acknowledges that realities are multiple and socially constructed, the social constructivist paradigm was ideally suited to exploring teachers' contextualised experiences and interactions with the researcher and colleagues.

The constructivist approach is informed by an ontological perspective that recognises reality as multidimensional, complex and subjective, and an epistemological perspective that sees knowledge production as based on participants' interaction and interpretation in various contexts. Accordingly, it values personal subjectivity and considers the researcher as a co-participant during the processes of data collection and analysis (Braun & Clarke, 2022). Such an orientation highlights the researcher's positionality in relation to the study participants, acknowledging that her/his personal characteristics, biases, expertise and background influence the conduct and findings of the research.

4.1.1.2 Positionality

The authors of the COREQ reporting checklist recommend that qualitative researchers disclose their personal information and relationships with participants since, they argue, it is impossible to avoid the influence of personal biases when the researcher is directly involved (Tong et al., 2007). Accordingly, the following paragraphs present a brief description of my personal characteristics and background.

My academic journey spans different countries, including Saudi Arabia, the United States and Australia. I obtained bachelor's and master's degrees in special education, with a focus on autism and intellectual disabilities. I have been involved in many previous qualitative research projects, in which I have utilised the interview method. I am a married father in my early thirties with an Arabic heritage, having been born and raised in the east of Saudi Arabia. These characteristics allow me to interpret the study's findings through a unique cultural lens and contextual understanding.

As part of my preparation for this research journey, I completed several university subjects in qualitative methodology and attended various specialist sessions, particularly in reflexive thematic analysis. During both my teaching and non-teaching activities, I interacted with students and colleagues, some of whom had later been recruited as participants in this study. However, during the collection of data for this study, I had no role or position in any educational sector in Saudi Arabia.

4.3 Methodology

The ability to anticipate local obstacles and devise potential solutions is an important aspect of effective professional practice. Léegaré and Zhang (2013) recommended that any knowledge-to-action project should adopt a specific conceptual framework to guide and facilitate the study of contextual barriers and enablers. Accordingly, the present study adopted the KTA framework.

As explained in Chapter 3, the selection of research procedures and techniques should be guided by the study's research objectives and theoretical framework. A qualitative research design was selected for this component of the study because of its suitability to facilitate a deeper understanding of contextual barriers that inhibit the implementation of EBPs, and the adaptations that need to be made to enhance teachers' knowledge and practice. Previous research using this framework has employed a variety of qualitative methods to identify barriers and potential facilitators, including focus groups (Claude et al., 2012; Petzold et al., 2010), interviews (Tugwell et al., 2007), workshops (Straus et al., 2008), and meeting discussions (Molfenter et al., 2009). All of these methods are widely used in the qualitative research literature to explore diverse issues (Morgan & Hoffman, 2018a). In the context of the present study, the focus group method (Powell & Single, 1996) was selected because it provides a unique set of advantages for generating rich data, as elaborated below.

4.3.1 Focus Group Method

Focus group discussions integrate interview structure while allowing spontaneous interactions among participants and observing verbal and non-verbal cues (Plummer-D'Amato, 2008a). The data generated from focus group discussions enables researchers to analyse differences and similarities within and across groups of participants. Sharing ideas within a group discussion encourages participants to define their position and support or oppose the views of others. On many occasions, focus group participants could even modify their attitudes based on information or opinions shared by others (Plummer-D'Amato, 2008a). The literature proposes that focus groups have the potential to generate more in-depth information compared to individual interviews. Focus groups can also leverage iterative and evolving discussions from diverse perspectives (Morgan & Hoffman, 2018b). A further compelling reason for selecting a focus group method for this study is its suitability for use with homogenous participants who share similar knowledge and cultural norms and are

willing to cooperate to stimulate conversation around the study issues (Creswell & Poth, 2016).

Focus group design can be used for a range of specific purposes, including needs assessment, program theory development, and implementation and outcome evaluation (Ryan et al., 2014, p. 2). This made it ideal for the present study, which sought to capture the shared knowledge and experience of teachers of students with autism in order to identify both challenges to the implementation of EBPs in educational settings and strategies to address them. In addition, the focus group method aligns with the constructivist approach and epistemological position that informed the study design. As Morgan and Hoffman (2018a) suggest, "the interaction in focus groups has been treated as a co-construction of meaning among the participants" (p. 256). Embracing a constructivist approach also encouraged me to consider the environmental and social contexts of the Saudi context and to encourage diverse viewpoints that might be expressed.

4.3.2 Sampling

In qualitative research, researchers aim to deeply investigate social phenomena through the lens and perspective of a target population. Therefore, the selection of participants in qualitative studies is based on the characteristics of individuals, which consequently allows for addressing the research enquiries. Cohen et al. (2018) assert that "size is not the most important sampling issue, depth or data saturation is the goal" (p. 9). The guiding principle is the requirement "to collect extensive detail about each site or individual studied" (Creswell & Poth, 2016, p. 126). In this study, purposive sampling (Obilor, 2023) was employed to recruit teachers of students with autism in Saudi Arabia.

4.3.3 Study Population

The target population comprised male and female teachers who engaged in teaching students with autism in both public and private schools. This included teachers of students

with autism who were employed in schools within the Al-Ahasa region, in the east of Saudi Arabia. Teachers in this region work in different locations, overwhelmingly in primary public schools, and in three types of settings: general educational classrooms, special educational classrooms, and special schools exclusively for students with autism. The total population of male and female teachers in public schools who met the eligibility criteria in Al-Ahasa region was calculated at 108. However, there were no data available to determine the number of teachers working in the private sector.

Purposive sampling allowed for the recruitment of a homogeneous population. At the same time, the aim of focus groups is to "explore diversity and determine the range of views, rather than to establish representativeness" (Plummer-D'Amato, 2008a, p. 70). In the current study, this was taken into consideration by recruiting both male and female teachers who worked in both public and private schools.

4.3.4 Recruitment Procedures for the Qualitative Investigation

Participants were purposefully recruited to attend two focus group meetings. Unfortunately, the researcher was unable to recruit female participants from the private sector, as none of the private schools approached agreed to participate. Initially, the administrative authority or the school principal had to express their willingness to participate in this study and allow the researcher to visit the school. However, teachers themselves were required to provide voluntary consent to participate. On two occasions, male teachers from two public schools signed the consent form, but dropped out of the first focus group meeting and later expressed their unwillingness to continue. Although the researcher eventually recruited six groups represented equally by male and female teachers, the procedures took longer than anticipated due to frequent rescheduling.

Schools were initially approached by the Agency for Development and Planning under the Ministry of Education in Saudi Arabia. Then the researcher sent an invitation email

(Refer to Appendix C). School visits were later scheduled with male teachers. As previously explained, this was not possible for female teachers due to cultural prohibitions. Instead, the schools suggested communicating by email or through Zoom if teachers requested further information about the study.

Participants were recruited according to specific inclusion criteria: (1) hold a bachelor degree or certificate in a related field and work directly with students with autism (administrative staff were excluded); (2) either currently employed (full- or part-time) or enrolled in the pre-service teacher programme; (3) work in schools that provide psychological, social and educational services for students with autism; (4) give written informed consent. The researcher worked with school principals to ensure that nominated teachers fulfilled the inclusion criteria. The characteristics of focus group participants are detailed in Chapter 6.

There is no consensus in the research literature regarding the ideal size of a focus group. Plummer-D'Amato (2008a) recommends six to eight participants, while others suggest a range of three to 12. There are potential benefits and limitations in different group sizes: for instance, a small group may reduce opportunities for interaction, which is considered an essential feature of focus group design, while a larger number of participants could make the discussion difficult to manage. Similarly, Krueger and Casey (2002) observe that "it is desirable to have enough people to generate diverse ideas but not so many participants that they do not have a chance to share" (p. 4). In relation to the number of groups, a minimum of four is considered adequate when the participants are homogenous and the investigation is concerned with shared experiences (Plummer-D'Amato, 2008a).

4.3.5 Structure of Focus Group Questions

The construction of FG questions involves many challenges. Krueger and Casey (2002) indicate that a common problem when developing FG questions is creating a set of

intriguing questions that provide insight into the core research issue. In this study, a systematic approach to developing the FG questions was adopted, based on the multilevel conceptual framework developed by Domitrovich et al. (2008) for effective implementation of EBPs in a school context.

This framework categorises factors that affect the adoption and implementation of EBPs into three levels: macro, school, and individual. For example, factors related to the school level include the attitude of the administration towards the adoption of EBPs and the extent to which they support staff to implement innovative practices. These three-level factors were used to create three groups of questions, each addressing one of the challenges that inhibit the implementation of EBP in an autism classroom context. In addition, the ADAPT process model (Moore et al., 2021) was used to build other questions exploring the impact of factors associated with the Saudi context on EBPs adoption. These two conceptual frameworks guided the development of questions that directly focused on the study's purpose. The questions themselves were designed using a funnel approach (Morgan & Hoffman, 2018a). This approach allows for presenting broad questions followed by more specific ones. The FG interview guide was divided into various sections and included multiple questions (Appendix L).

In this study, various initiatives were undertaken to ensure the trustworthiness and validity of FG questions. The FG questions were first reviewed by the researcher's supervisors. The questions were then refined, and many were paraphrased, deleted or added as recommended. In addition, it has been suggested that the native language of participants be used when conducting FG meetings and that interpreters be avoided (Krueger & Casey, 2002). Therefore, the FG questions were translated into Arabic by the researcher and later certified by a translation agency (Appendix M).

4.3.6 Settings and Meeting Mode

The focus group meetings were conducted at six school sites located in the Al-Ahasa region, in the east of Saudi Arabia. The Saudi government provides free education for all citizens; however, some parents enrol their children in private schools, which the Ministry of Education also administers. Like their mainstream counterparts, students with special needs, including students with autism, are provided with free educational opportunities and supportive learning environments. While the ultimate goal is to include students with autism in a general education classroom, "much work still needs to be done before inclusive education is implemented in Saudi Arabia" (Almalky & Alwahbi, 2023, p. 8).

During the recruitment stage, it emerged that most of the teachers who met the eligibility requirements worked exclusively in schools that were established only for students with autism. Therefore, the school sites reported in this study were predominantly represented by those teachers; only one site, an all-female school, delivered educational services in a partial inclusion program (a special education classroom in a general education school).

Ultimately, three groups of male teachers were recruited from two public schools and one private school, and three groups of female teachers were recruited from three schools: two were autism-specific schools, and the third was a mainstream school with special education classrooms. Table 4.1 describes the settings and procedures adopted for the groups of male teachers.

Table 4.1

Description of Settings and Procedures: Male Focus Groups

	Physical Setting
Group 1: Teachers from a	This focus group was conducted in two sessions over a single day in the participants' school. The researcher first met with the recruited teachers to

private school	further explain the study's aim and expectations and then proceeded to the arranged meeting room. The room was small but cosy, with a traditional Arabic floor arrangement that provided an informal and comfortable atmosphere. It was located some distance away from the administration offices and classrooms and was used as a staff room for teachers. Food and coffee were available in one corner.		
	Meeting Mode	**Duration**	**Time of Day**
	Face-to-face	1st Meeting: 1hr 2 min 2nd Meeting: 38 min	Morning and afternoon
Group 2: Teachers from a public school	**Physical Setting**		
	The meetings took place in the conference room in the participants' school, in keeping with their preference. The room was spacious, with good lighting and air conditioning. Chairs were arranged around square tables, which gave the room a formal, professional feel, but were not particularly comfortable for a long meeting.		
	Meeting Mode	**Duration of FG**	**Time of the Day**
	Face to face	1st Meeting: 43 min 2nd Meeting: 55 min	Early morning
Group 3:	**Physical Setting**		

Teachers from a public school	This focus group was conducted in the staff room of the participants' school. The furniture was adequate, although I suggested rearranging the table and chairs into a U-shape to enhance engagement.		
	Meeting Mode	**Duration**	**Time of Day**
	Face to face	1st Meeting: 36 min 2nd Meeting: 50 min	Early morning

As mentioned earlier, the female schools in Saudi Arabia are entirely run by female staff and serve only female students. The researcher had previously discussed the preferred mode for conducting the FG with the school principal and the assigned coordinator, and a virtual meeting, using the Zoom platform, was agreeable to the teachers. In each setting, teachers gathered in one location, such as a conference room, to participate. Necessary equipment and access to the internet were organised in advance The researcher scheduled the Zoom meeting at least a day before and shared the invitation link with the school coordinator. Table 4.2 describes the settings and procedures adopted for these groups.

Table 4.2

Description of Settings and Procedures: Female Focus Groups

Group 4: Teachers from a public school with special education classrooms	**Meeting Mode**	**Duration**	**Time of Day**
	Virtual meeting through ZOOM	1st Meeting: 46 min 2nd Meeting: 1hr 12 min	End of the school day
Group 5:	**Meeting Mode**	**Duration**	**Time of Day**

Teachers from a public school	Virtual meeting through ZOOM	1st Meeting: 53 Min 2nd Meeting: 1hr 14 min	Morning and afternoon
Group 6: Teachers from a public school	**Meeting Mode**	**Duration**	**Time of Day**
	Virtual meeting through ZOOM	1st Meeting: 42 min 2nd Meeting: 43 min	Morning

4.3.7 Pilot Testing

A pilot study is widely recommended for qualitative research in general and for FG studies in particular (Ismail et al., 2018). Breen (2006) argues that pilot testing in the context of FG design enables the researcher to examine the representativeness of the recruited sample, the suitability of the number of participants in each group, and the interaction dynamics. Researchers can also assess their moderating style, which in turn determines the amount of involvement they have and allows them to refine their communication skills and other management responsibilities.

A pilot study can serve one of two distinct purposes. The first one is related to feasibility studies, where the purpose is only to examine the practicality of methods and procedures while predicting potential challenges. The other purpose of pilot studies is to conduct preliminary research that explores the research problem on a smaller scale (Van Teijlingen & Hundley, 2001). In the present study, the purpose of pilot testing was to examine the feasibility of the planned procedure. The first two focus group meetings for both males and females were used to test the research design and identify potential issues. During the meeting, the researcher, who served as moderator throughout the study, directly asked participants if the questions were understandable. This feasibility assessment did not result in

any significant changes to the research design or the FG discussion guide. However, it revealed the need for some clarification of the vocabulary and suggested the use of easy introductory questions to encourage dialogue.

It is common practice to exclude participants and data obtained from pilot testing from the main study in order to ensure research integrity (Van Teijlingen & Hundley, 2001). However, the data from the first two FGs were incorporated in the present study. This decision was considered to be justified for two main reasons. First, the feasibility evaluation yielded no significant change to the research design or discussion guide. Second, as pointed out by Van Teijlingen and Hundley (2001), qualitative research is a continuous process of improvement and adjustment in which each interview or focus group discussion can be informed by the previous ones. Hence, there is no clear-cut line between a pilot study and any subsequent data collection using the same method.

4.3.8 Procedure

Twelve meetings were conducted in six different school sites over eight consecutive weeks. The time and mode of the meetings were determined in consultation with each group. However, all FG meetings followed similar procedures, as explained below.

At the beginning of the meeting, the researcher greeted the teachers and expressed gratitude to the school administration for allowing the meeting to take place. The researcher and the participants introduced themselves. The participants were then informed that FG meetings would be audio-recorded and that any information obtained would remain confidential. Finally, teachers were reminded that attendance is voluntary and that they could withdraw from this study at any time or decline to respond to any question.

To maximise productivity and ensure a smooth process, clear and defined roles and expectations for the researcher and the recruited participant are critical to maximising productivity and ensuring smooth processes. Throughout all focus group meetings, the

researcher provided a timetable outlining the meeting activities and the estimated total meeting time. The participants were also presented with clear expectations regarding their roles and responsibilities. A further explanation of the nature of focus group discussion was provided to participants, and they were assured that the researcher "is a non-participant whose role is to facilitate the group processes and ensure the discussion covers the topics of interest" (Plummer-D'Amato, 2008, p. 71). Finally, the researcher emphasised the importance of maintaining confidentiality about the discussion, demonstrating respectful behaviour and valuing others' viewpoints.

The meetings were scheduled based on the participants' preferences and availability. Although these meetings took place over an 8-week period, it was sometimes necessary to plan more than one meeting of different groups on the same day. Constraints of time, budget and participant availability meant that it was not possible to implement the iterative process of simultaneous data collection and analysis, which aims to achieve saturation.

4.3.9 Question Design and Sequencing

While the main goal of the discussion was to elicit participants' perspectives on the challenges that inhibit the adoption of EBPs in classrooms, their responses could not be considered in isolation from the Saudi social context. Therefore, the researcher began the discussion by introducing questions that centred around factors specifically related to the local context and may have an impact on the implementation of EBPs in educational settings. The focus group questions were presented through PowerPoint slides (Appendix N). Various probes were used to elicit more detailed information. Subsequent questions explored implementation challenges at three levels: macro, school, and individual. When a particular factor was mentioned, the researcher asked participants for their suggestions as to how that obstacle could be addressed. In this way, data on both the perceived challenges and recommended solutions were collected at the same time.

Other questions were deliberately designed in compound form that could be answered yes/no or agree/disagree. These were not intended to generate detail but to facilitate a voting-style system that could serve as an icebreaker to stimulate discussion. Across all focus group discussions, open questions were asked to introduce the topic or warm up the conversation, whereas others were structured to elicit specific and critical answers. Morgan and Hoffman (2018) argue that a funnel approach allows for the inclusion of varied question types, and that it is sequenced “from less-structured, open-ended questions to more structured, targeted questions” (p. 10).

4.3.10 Data Recording and Storage

As previously mentioned, the Zoom platform and audio recording equipment were utilised to capture the data. In order to ensure confidentiality, unique meeting IDs with passwords were generated for each meeting to prevent unauthorised access. In addition, the waiting room feature was activated to allow the researcher to verify the identities of registered participants. The researcher first saved files to a locally encrypted drive protected by FileVault and then uploaded them to Microsoft's OneDrive for safe cloud storage. Hard copy materials were also digitised to reduce the risk of loss or damage and make data storage and analysis easier. After that, all hard copy documents were disposed of safely, following relevant ethical guidelines. Finally, all collected data were transferred from OneDrive to the university's data store platform.

4.4 Summary

This chapter has used the COREQ checklist to report the procedures undertaken to collect and report the qualitative data in this study. It explained the rationale for adopting a focus group design and described the processes of sampling and recruitment of participants. The study settings, research instrument and data collection processes were described. Details of the method of analysing the qualitative data are provided in Chapter 6, together with the

results of that analysis. The following chapter presents the results of the analysis of the quantitative data.

Chapter 5: Quantitative Component: Data Analysis and Results

This chapter describes the methods and procedures of analysis of the quantitative data and presents the results of these analyses. The previous two chapters provided a general overview of the methodological components of the study. The decision to discuss data analysis in direct association with the presentation of results in this (and the next) chapter reflected not only the desirability of achieving a balanced distribution of content across chapters, but also to enable readers to have closer access to the data analysis methods when evaluating the results.

5.1 Data Analysis

This section explains the methods used to analyse the responses obtained from administration of the modified version of the Early Intervention Practices Scale (Paynter et al., 2017). The scale aimed to measure teachers' knowledge and use of three different teaching practice categories: evidence-based practice (EBPs), emerging practices (EM), and unsupported practices (UN). This component of the study addressed research question: How do teachers of students with autism in Saudi Arabia rate their knowledge and use of evidence-based, emerging and unsupported practices? and Sub-question**:** How do demographic factors such as gender, years of experience, and employment sector relate to the reported knowledge and use of evidence-based, emerging and unsupported practices?

The section first describes how the quantitative data were prepared for data analysis, explains the choice of analytic method, describes the measures used to examine the validity and reliability of the results, and outlines the statistical tests employed in relation to data distribution and the detection of outliers. This is followed by an account of the methods of descriptive and inferential statistics used to analyse the data. The final section presents the results of these analyses.

5.1.1 Preparing the Quantitative Data for Analysis

As explained in Chapter 3, the survey participants were teachers of students with autism who worked in the Ministry of Education in Saudi Arabia. A cross-sectional design was employed to investigate their knowledge and use of different teaching practices, and to determine the relationship between demographic factors and self-reported knowledge and use. The survey was available online for four months. During the last few weeks of data collection, a very low response rate was observed, and, in the days before the closing date, no new responses were registered. The survey was then deactivated manually to prevent any new participation and prepare the existing data for analysis.

5.1.1.1 Software

The selection of appropriate statistical software from the multiple programs available depends on personal preference, availability, research data suitability, and needs (Miller et al., 2009). In the current study, the IBM Statistical Package for Social Science (SPSS version 29.x) was selected to conduct basic descriptive investigations, such as frequencies, means and standard deviations, validity and reliability tests, as well as advanced comparison analysis across groups. SPSS was selected due to its user-friendly interface design and multi-use comprehensive statistical data output when compared to other software (Ong & Puteh, 2017; Roever & Phakiti, 2017).

5.1.1.2 Exporting Data and Handling Missing Values

The data were first exported from Qualtrics into an SPSS spreadsheet. The researcher then checked that the transferred data corresponded with the previously saved PDF document and contained all the survey items, including participant demographics. Missing responses were rarely found because the forced completion feature in Qualtrics was activated to allow submission for only completed responses. However, it was noticed that some participants

withdrew after completing the demographic information section and did not enter or complete the scale measuring knowledge and use of teaching practices.

Dealing with missing data is a key consideration in ensuring valid research outcomes. Different mechanisms are available to deal with missing data, selection being based on the classification or circumstance that led to missing data (Sainani, 2015). In this study, Missing Completely at Random (MCAR) was more likely to be the case, since no observed or unobserved variables could be identified to explain the lack of responses (Sainani, 2015). Using statistical methods to recover the missing data was impossible in this case. Therefore, listwise or complete case deletion was performed since no data related to the teaching practices scale were provided. As such, all participants with any missing data were deleted and thus excluded from analysis. According to Sainani (2015), deleting incomplete responses "will not bias the results if the data are MCAR, because the analysed sample is a random subset of the complete sample" (Sainani, 2015, p. 991).

5.1.1.3 Coding Data

Accurate analysis depends on identifying the type of quantitative data (ordinal, nominal, ratio, or interval) the researcher is dealing with (Roever & Phakiti, 2017). In this study, demographic data were collected using a nominal variable with only one selection option in the form of multiple-choice questions. Each response category was assigned a number (e.g., 1 for Male and 2 for Female). Data on knowledge and use of teaching practices were collected using a five-point scale for each category. Numerical ordinal values were assigned to each response from 0 to 4.

5.1.2 Method of Analysis

The selection of particular methods of analysis depends on many factors, including the overall study design and objectives, sample size, assumption of statistical tests and, more importantly, the type of data obtained (Roever & Phakiti, 2017). Ordinal data is a type of

categorical data that allows participants to rank specific traits or measure their performance using a fixed-response format (Roever & Phakiti, 2017; Stockemer & Bordeleau, 2023). This study obtained ordinal data using a 5-point Likert-type scale.

5.1.2.1 Treating Ordinal Likert Scales Data as Interval

While ordinal data provide a clear ranking order, they fail to specify the extent of the differences between values (Roever & Phakiti, 2017). Interval data have an equal space between values. There is a lack of consensus regarding the use of parametric tests to analyse Likert scale data (Knapp, 1990; Mircioiu & Atkinson, 2017). Some researchers assert that it is important to have an equal gap or consistent difference between values for the conduct of parametric tests, and that ordinal data must be analysed using non-parametric tests (Jamieson, 2004). However, others argue that parametric tests can be used to analyse ordinal data under certain conditions, such as normal data distribution and appropriate sample size (Mircioiu & Atkinson, 2017; Sullivan & Artino Jr, 2013).

In this study, the latter viewpoint was adopted for several reasons. First, Likert scale data are often analysed as though they represent interval-level measurements. Numerous studies have shown that, at the scale level, the Likert response format yields data that function empirically as interval (Carifio & Perla, 2008). In many social science disciplines, it is common practice to use parametric tests to analyse ordinal data because of its robustness and wide range of statistical functions (Brown, 2011; Sullivan & Artino Jr, 2013). This includes educational research publications, where means and standard deviations are often computed from ordinal data (Roever & Phakiti, 2017, p. 39). When the results obtained from parametric and non-parametric Likert scale ordinal data tests are compared, they lead to the same conclusions (Mircioiu & Atkinson, 2017; Murray, 2013).

Second, these methods were employed to analyse the results obtained from the original scale, which was adapted for use in the current study (Paynter et al., 2017; Paynter &

Keen, 2015). The use of parametric tests was considered appropriate because our study met the relevant conditions for using them to analyse ordinal data, including at least a five-point Likert scale, an appropriate sample size, and a normal distribution of responses (Brown, 2011; Jamieson, 2004). According to Norman (2010), applying parametric tests to interval-level data neither compromises the precision of results nor produces erroneous conclusions. He argues that, despite the ordinal nature of the Likert scale, parametric tests (such as means, standard deviations, and t-tests) are sufficiently robust for analysing interval data and may be a more appropriate choice than non-parametric tests.

5.1.2.2 Descriptive and Inferential Statistics

Descriptive analysis summarises the main characteristics of the data and presents the results in an organised and accessible fashion (Mahsin, 2022). Descriptive statistics are used for a variety of purposes, including describing the overall features of a sample or subgroups by reporting central tendencies and variability, or to help identify relationships, patterns or trends in the data.

In this study, descriptive statistical analysis was conducted after cleaning the dataset and verifying accurate numerical coding and variable labelling. The final dataset only included responses from participants who answered all the survey questions. All categorical variables were represented with numbers, and the labels of those values were entered into SPSS, ensuring that each number was assigned to the correct category name.

Descriptive statistical procedures, such as calculating measures of central tendency and variability, frequencies or percentiles, are strongly advised as a precursor to further data analysis (Roever & Phakiti, 2017). In addition to facilitating the handling and reporting of large datasets, they provide a foundation for performing more complex inferential analyses.

This study used SPSS to analyse participant demographics and compute descriptive statistics (e.g., frequency and percentage) in order to identify participants' knowledge and use

of teaching practices. Means and standard deviations were also calculated for the scale items, including individual teaching practices, and for overall scores in each teaching practice category. After the sample was divided into subgroups, descriptive analysis was performed to assess participants' overall knowledge and use of different teaching practices. Means and standard deviations were calculated for all teaching practices after participants were reorganised into subgroups based on demographics (gender, years of experience, and employment sector). Means and standard deviations were calculated for individual teaching practices, and additional descriptive analyses were undertaken to calculate average scores for the broader teaching-practice categories (EBP, EM and UN). These procedures were performed both for the overall sample and within subgroups, enabling comparisons of participants' knowledge and use of practices across the different categories.

In contrast to descriptive statistics, inferential methods extend beyond summarising data by examining variances, testing hypotheses and drawing conclusions (Stapor, 2020). A variety of tools are available for these purposes. Allua and Thompson (2009) identify three basic categories of inferential tests according to their intended purpose: evaluating differences, examining relationships, and making predictions (p. 168). The main consideration in the selection is the number of groups being compared and the relationship between groups (Hedrih & Hedrih, 2022). This study employed repeated measures ANOVA to compare the teaching categories' averaged means across all participants (N = 106), in parallel with omega square, to determine the overall effect size. Subsequently, when the ANOVA test showed that differences between means of knowledge or use of teaching categories were statistically significant, post hoc tests, t-tests with Holm-Bonferroni correction, were employed to identify precisely which pairs of groups differed. Cohen's d was reported to measure the magnitude of mean differences.

For the second research question, however, the independent-samples t-test and one-way ANOVA were used because the groups being compared were independent. While both function similarly, the independent-samples t-test is used to compare two groups, while the ANOVA examines the differences among two or more groups (Roever & Phakiti, 2017). It should be noted that RM-ANOVA had previously been used to compare the same group (N=106) across three conditions, corresponding to the ratings of the three different teaching categories. In contrast, the analyses addressing the second research question focused on comparisons between independent groups. Independent-samples t-tests were conducted for two-group comparisons (e.g., male v. female teachers), whereas one-way ANOVA was applied to the variable of years of experience, which comprised three subgroups. When the ANOVA revealed statistically significant differences, post hoc pairwise t-tests were performed.

Pearson's correlation coefficient was used to examine the relationship between the knowledge and use scales. This was the only occasion on which correlational analysis was employed; all other analyses examined statistical comparisons across variables. The following sections elaborate on the measures adopted in relation to normality, validity and reliability.

5.1.3 Data Distribution and Normality Measures

It is vital to examine the normality of data distribution in parametric statistics because these tests are based on the assumption of a normal distribution. Since the true sampling distribution is generally unavailable, the data are assumed to be distributed normally. Data distribution, however, can be influenced by several factors, including the type of data (categorical or continuous), sample size, participant characteristics and the presence of extreme values such as errors or outliers (Altman & Bland, 1995; Krithikadatta, 2014).

Skewness and kurtosis are two statistical measures reported in this study to assess deviations of the data distribution from a theoretical normal distribution. Skewness measures the extent of asymmetry in the data; in other words, it describes "whether more of the data are at the low end of the range or the high end of the range" compared to an ideal normal distribution (Roever & Phakiti, 2017, p. 40). Kurtosis assesses the shape of the tails of the distribution to show whether it is peaked (leptokurtic) or flat (platykurtic) (Roever & Phakiti, 2017). Additionally, the Shapiro-Wilk Test was used to examine the fit of the data to a normal distribution. This test is widely recognised as the most powerful normality test, and is particularly suitable for medium-sized samples (Razali & Wah, 2011). Tables 5.1 and 5.2 present the results of these three statistical measures for the knowledge and use scales.

Table 5.1

Descriptive Statistics, Skewness, Kurtosis and Shapiro-Wilk Test Results for the Knowledge Scale

Knowledge Scale	**Mean**	**SD**	**Skewness**	**Kurtosis**	**Shapiro-wilk**
EBPs	2.63	1.03	-0.85	0.24	**p<.01**
Emerging Practices	2.31	1.00	-0.40	-0.18	**.01**
Unsupported Practices	2.11	0.97	-0.15	-0.41	.13

Note. Shapiro-Wilk test results significant at p≤ .05 are bolded.

Table 5.2

Descriptive Statistics, Skewness, Kurtosis and Shapiro-Wilk Test Results for the Use Scale

Use Scale	**Mean**	**SD**	**Skewness**	**Kurtosis**	**Shapiro-wilk**
EBPs	2.39	0.92	-0.62	0.29	**.01**
Emerging Practices	2.09	0.99	-0.02	-0.39	.06
Unsupported Practices	1.79	0.91	0.06	-0.51	.45

Note. Shapiro-Wilk results at p≤ .05 are bolded.

In relation to skewness, it is suggested that a value of ±1.00 indicates that the data do not deviate too much from the theoretical normal distribution. In contrast, values outside of ±3.00 are highly skewed, jeopardising the execution of the parametric statistical tests and violating its analysis results (Roever & Phakiti, 2017). Table 5.1 shows that the EBP data are slightly to moderately negatively skewed, with a leftward tail and values clustered toward the higher end. In contrast, data from the use of Emerging and Unsupported Practices scales are nearly symmetrical, with minimal skewness. Applying the same criteria to kurtosis, the Emerging and Unsupported Practices scales display a somewhat platykurtic distribution (flatter peak), while the EBP scale shows slightly positive kurtosis (more peaked). The Shapiro-Wilks normality test indicates that data deviated from the normal distribution for three out of the six tested scores. However, the deviations can be considered relatively minor because the skewness and kurtosis statistics fall within the range of ±1, which is considered a very conservative extent for interpreting the magnitude of deviations from normality (Hedrih & Hedrih, 2022).

5.1.4 Validity and Reliability

It is essential to employ a well-constructed data collection instrument because the quality of findings depends on both the chosen instrument and the procedures employed. McNabb (2015) emphasises that, in quantitative research, it is essential that the instrument accurately measures the intended construct and yields consistent results each time it is used. In other words, establishing the instrument's validity and reliability is essential for generating trustworthy research outcomes.

This study employed the Early Intervention Practices Scale (EIPS), which had previously been validated in several research studies (e.g., Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015), to evaluate teachers' knowledge and use of different teaching

practices. The EIPS was modified in accordance with the most recent literature on EBPs, and translated into Arabic. While the goals of this study were similar to those of previous investigations that used the EIPS scale, validity and reliability of the modified version had to be tested. Reinforcing this decision, Henson (2001) emphasises that "researchers should report reliability for their scores, and not depend on estimates from prior studies or test manuals" (p. 186).

Several types of validity should be considered when developing a survey instrument, including face, content, construct, and criterion validity (Fink & Litwin, 1995). According to Taherdoost (2016), face validity is the least formal type, and non-experts can be used for this type of assessment by confirming that the survey is relevant, easy to understand, and has appropriate language and formatting. In contrast, content validity is assessed by experts to ensure that the survey items or domains accurately represent the concept being measured and exclude unrelated items. Construct validity captures how well a concept or idea is translated into a practical, operational survey based on an examination of convergent and discriminant validity. Finally, criterion validity evaluates the instrument's ability to accurately predict the outcomes it was designed to measure.

Reliability is a key aspect in evaluating the consistency and repeatability of an instrument's results (Henson, 2001; Taherdoost, 2016). Different methods for estimating reliability have been developed depending on the type of data and research context (Gadermann et al., 2012). For example, test-retest reliability is assessed by re-administering the survey to the same participants under similar conditions after a certain period of time and calculating the correlation between the two administrations. This approach, however, has the potential to produce biased results because participants are familiar with the test (Roever & Phakiti, 2017). Alternatively, split-half reliability can be used to estimate internal consistency: the survey is divided into two parts, which are scored separately, and the

correlation between the results is computed (Roever & Phakiti, 2017). Compared to these procedures, Cronbach's alpha (Cronbach, 1951) is a more practical measure of internal consistency and is widely employed in research (Gadermann et al., 2012; Taherdoost, 2016).

5.1.5 Procedures for Validity and Reliability in this Study

Several steps were taken early on in the design of the study to establish validity. The supervision team and a professor in special education from Saudi Arabia reviewed the survey's content to ensure its content validity. The survey underwent multiple reviews to ensure that the items aligned with the recent relevant literature and with the study's aims. The survey was distributed using Qualtrics, a user-friendly platform that enables customising of questions and response options. A pilot study was conducted, in which a link to the survey was sent to two teachers and one lecturer in Saudi Arabia, who were invited to provide feedback on the clarity of the items and the appropriateness of the design and language. As a result, some potentially misleading or confusing items, mainly involving definitions of teaching practices, were revised. Modifications were also made to enhance face and content validity, such as incorporating a forced-response feature, arranging items alphabetically, providing a certified translation by a specialised agency, and maintaining anonymity to encourage honest responses.

Construct validity is the most challenging type of validity to measure and report, as it cannot be reduced to a single statistic. Fink and Litwin (1995) suggest that it is best assessed by examining how consistently an instrument performs across diverse settings, populations and time periods. Others suggest using confirmatory and exploratory factor analyses as statistical techniques for assessing construct validity (Thompson, 2004). In this study, principal axis factoring was used to conduct confirmatory factor analysis on the knowledge and use item scales separately. However, the analysis could not be completed due to an indefinite covariance matrix, and neither a three-factor nor a one-factor solution was

supported. Additionally, exploratory factor analysis using Horn's parallel analysis indicated that the three subscales (EBPs, EM Practices, and UN Practices) should not be treated as latent variables but, rather, as emergent (formative) constructs.

More specifically, the reflective model does not adequately represent the relationships among scale items or the direction of causality from variables to their indicators (i.e., teaching practices). Instead, the scale fits a formative model in which the three categories of teaching practices define the construct rather than reflect it. According to Coltman et al. (2008), items of the formative model, such as those in this scale, do not load onto single or multiple factors, as they are independent and non-interchangeable. For example, within the EBP category, each teaching practice independently contributes to defining the construct. This formative structure may also explain the absence of factor analysis in previous applications of the Early Intervention Practices Scale (EIPS) (Barry et al., 2021; Paynter et al., 2019; Paynter et al., 2017; Paynter & Keen, 2015).

While validity refers to the extent to which an instrument measures what it is intended to measure, reliability is concerned with the internal consistency of the instrument (McNabb, 2015; Roever & Phakiti, 2017). In this study, Cronbach's Alpha was calculated using SPSS. Cronbach's Alpha "is most affected by how strongly test or questionnaire items correlate with each other since this inter-item correlation reflects how well the items measure the same attribute" (Roever & Phakiti, 2017, p. 221).

Reliability of the EIPS remained satisfactory across previous studies, demonstrating a good to adequate reliability coefficient ranging from 0.66 to 0.93 (e.g., Alatifi et al., 2023; Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015). Cronbach's Alpha can be significantly influenced by the number of items included in the survey as well as the size and nature of the recruited sample (Roever & Phakiti, 2017). According to Tavakol and Dennick (2011), when the items in a survey are too few, then the value of alpha is expected to be

reduced, and a larger and heterogeneous research sample is more likely to produce a higher value.

5.1.5.1 Reliability Assessment Results

Cronbach's Alpha values range between 0 and 1, with values closer to 1 indicating stronger reliability (Tavakol & Dennick, 2011). Although Cronbach's Alpha can be calculated for the overall scale (See Barry et al., 2021), it is recommended that reliability be reported for each category separately (Paynter et al., 2017; Paynter & Keen, 2015). As Tavakol and Dennick (2011) have observed, "if a test has more than one concept or construct, it may not make sense to report alpha for the test as a whole as the larger number of questions will inevitably inflate the value of alpha" (p. 54). Accordingly, reliability was calculated for each teaching practice category separately, as shown in Table 5.3.

Table 5.3

Cronbach's Alpha Values by Teaching Practice Subscale

	Subscale	**Cronbach's α**		**Subscale**	**Cronbach's α**
Knowledge	EBP	.97	**Use**	EBP	.95
	EM	.71		EM	.70
	UN	.84		UN	.82

The reliability analysis indicated that Cronbach's alpha values were satisfactory across all three teaching practice categories. For the EBP scales, both knowledge (α = .97) and use (α = .95) of EBP demonstrated very high internal consistency. The EM scales showed acceptable reliability, with α = .71 for the knowledge and α = .70 for use. The UN scale also showed good internal consistency, α = .84 for knowledge and α = .82 for use. Very high values, such as those observed for the knowledge and use scales, may suggest redundancy due to strong inter-item correlations. Although such redundancy might be seen to justify

reducing the number of items, this was not considered appropriate here since each item represents a distinct teaching practice. The high alpha values are also partly attributable to the large number of items, particularly in the knowledge scale (28 items). In addition, the items were derived from a systematic review and are theoretically linked to different teaching practice categories, which confirms their distinctiveness (See Hume et al., 2021; Steinbrenner et al., 2020).

5.2 Quantitative Results

This section reports the results of the analyses described above. In this section, participant demographics and results of the descriptive and inferential statistical analysis are presented to answer the quantitative research questions.

5.2.1 Participant Demographics

All participants provided background information on their age group, qualifications, gender and years of experience. Table 5.4 shows the results for 106 respondents.

Table 5.4

Demographic Characteristics of Survey Participants

Demographic Variable		**Number**	**Percent**
Age group	Under 25	8	7.5
	25-44	93	87.7
	45-64	5	4.7
Gender	Male	59	55.7
	Female	47	44.3
Highest Qualification	Diploma	4	3.8
	Bachelor	91	85.8
	Master	8	7.5

	Other	3	2.8
Years of Experience	Under 5 years	27	25.5
	From 5 to 15 years	69	65.1
	From 16 to 25 years	9	8.5
	Above 25 years	1	0.9
Language Used in Classroom	Arabic	96	90.6
	English	1	0.9
	Arabic and English	9	9
Geographical Region	Central Region	5	4.7
	Eastern Region	70	66
	Western Region	7	6.6
	Northern Region	23	21.7
	Southern Region	1	0.9
Role	Assistant Teacher	7	6.6
	Teacher	86	81.1
	Behaviour Analyst	3	2.8
	Psychologist	2	1.9
	Other	8	7.5
Educational Stage	Preschool	24	22.6
	Elementary School	56	52.8
	Middle School	12	11.3
	High School	3	2.8

	Other	11	10.4
Specialist Degree	Autism Spectrum Disorders	26	24.5
	Other Special Education Discipline	65	61.3
	Other Educational Specialty	3	2.8
	Applied Behaviour Analysis	1	0.9
	Psychology	5	4.7
	Other	6	5.7
Employer	Government Sector	85	80.2
	Private Sector	21	19.8

Almost 88% (n = 93) of the participants were aged 25-44; all other age groups combined accounted for the remaining 12%. Approximately two-thirds of participants reported having 5-15 years of experience (n=69), and the majority (85.8%, n = 91) held a bachelor's degree. Most participants (n=65, 61.3%) held a teaching certificate in autism spectrum disorder (n=26, 24.5%) or other special education discipline; the remaining 15 participants (14.2%) held a degree in related disciplines such as applied behaviour analysis, another educational speciality, psychology, or social work.

Information was also collected about aspects of the teaching environment, such as language used in the classroom, educational stage and employment sector. More than 90% (n=96) of teachers said they used Arabic in the classroom, while approximately 10% (n=9) used a combination of Arabic and English. The majority (75%, n=91) taught preschool and

elementary school, followed by middle school (n=12, 11.3%) and high school (n=3, 2.8%). The remaining participants selected “other”, with some of these specifying residential programs for individuals with special needs. Public sector teachers predominated (n=85, 80.2%) compared to those in the private sector (n=21, 19.8%).

Although the survey was distributed across all five geographical regions of Saudi Arabia, the response rates were uneven. The Eastern region accounted for the majority of participants (N=70, 65%), followed by the Northern region (N=23, 21.7%). The other regions accounted for between one and seven participants (a combined total of 12.3%). There was an even gender distribution, 59 (55.7%) males and 47 (44.3%) females.

5.2.2 Knowledge and Use of Teaching Practices: Descriptive Statistics

Descriptive statistics were calculated using SPSS to determine the means and standard deviations (SD) for both knowledge and use of teaching practices across the three categories: Evidence-Based Practice (EBP), Emerging Practice (EM) and Unsupported Practice (UN). The results for teaching practices are presented in Tables 5.5 and 5.6, organised into three sections, and accompanied by the item numbers as arranged in Qualtrics.

Table 5.5

Descriptive Statistics of Knowledge Items

Item	Category	Teaching Practices	Mean	SD
29	EBP	Reinforcement	3.19	1.20
26	EBP	Prompting	3.09	1.17
9	EBP	Direct Instruction	2.93	1.35
27	EM	Punishment	2.93	1.27
28	UN	Rapid Prompting Method	2.93	1.28
20	EBP	Modelling (K)	2.92	1.29
25	EBP	Peer-Based Instruction and Intervention	2.83	1.31

38	EBP	Video Modelling	2.83	1.28
14	EBP	Extinction	2.82	1.40
11	EBP	Discrete Trial Training	2.76	1.31
12	EBP	Exercise and Movement	2.75	1.37
39	EBP	Visual Supports	2.75	1.39
15	UN	Facilitated Communication	2.75	1.41
10	EBP	Differential Reinforcement	2.73	1.31
35	EBP	Task Analysis	2.73	1.31
1	EBP	Antecedent-based Intervention	2.72	1.18
24	EBP	Parent-Implemented Intervention	2.71	1.37
34	EBP	Social Skills Training	2.71	1.32
31	EBP	Self-Management	2.60	1.29
30	EBP	Response Interruption/Redirection	2.58	1.37
36	EBP	Technology-Aided Instruction and Intervention	2.58	1.39
8	EM	Collaborative Model for Promoting Competence and Success	2.57	1.43
7	EBP	Cognitive Behavioural/Instructional Strategies	2.55	1.28
17	EBP	Functional Communication Training	2.55	1.38
21	UN	Multisensory Environments/Snoezelen	2.46	1.33
3	EBP	Augmentative & Alternative Communication	2.42	1.44
16	EBP	Functional Behaviour Assessment	2.42	1.35
37	EBP	Time Delay	2.41	1.37

33	EBP	Social Narrative	2.38	1.38
13	EM	Exposure	2.35	1.32
23	EBP	Naturalistic Interventions	2.28	1.39
32	UN	Sensory Diet	2.13	1.53
5	EBP	Behavioural Momentum Intervention	2.10	1.34
22	EBP	Music-Mediated Intervention	2.06	1.50
18	UN	Holding Therapy	1.97	1.41
2	UN	Auditory Integration Training	1.88	1.44
40	UN	Weighted Vests/Clothing	1.87	1.54
4	EBP	Ayres Sensory Integration	1.81	1.44
19	EM	Matrix Training	1.38	1.42
6	UN	Brushing/Wilbarger Protocol	1.17	1.37

Note. The items are arranged in descending order of means.

Table 5.6

Descriptive Statistics of Use Items

Item	**Category**	**Teaching Practices**	**Mean**	**SD**
29	EBP	Reinforcement	3.14	1.13
26	EBP	Prompting	2.92	1.18
14	EBP	Extinction	2.79	1.34
28	UN	Rapid Prompting Method	2.75	1.28
9	EBP	Direct Instruction	2.74	1.35
20	EBP	Modelling	2.72	1.25
11	EBP	Discrete Trial Training	2.70	1.32
10	EBP	Differential Reinforcement	2.64	1.29

35	EBP	Task Analysis	2.63	1.24
27	EM	Punishment	2.61	1.31
39	EBP	Visual Supports	2.57	1.32
1	EBP	Antecedent-based Intervention	2.56	1.16
38	EBP	Video Modelling	2.55	1.30
34	EBP	Social Skills Training	2.52	1.30
12	EBP	Exercise and Movement	2.46	1.37
15	UN	Facilitated Communication	2.46	1.42
30	EBP	Response Interruption/Redirection	2.43	1.35
25	EBP	Peer-Based Instruction and Intervention	2.41	1.25
8	EM	Collaborative Model for Promoting Competence and Success	2.40	1.39
36	EBP	Technology-Aided Instruction and Intervention	2.35	1.37
7	EBP	Cognitive Behavioural/Instructional Strategies	2.32	1.37
17	EBP	Functional Communication Training	2.32	1.40
31	EBP	Self-Management	2.25	1.36
21	UN	Multisensory Environments/Snoezelen	2.25	1.32
37	EBP	Time Delay	2.24	1.31
3	EBP	Augmentative and Alternative Communication	2.22	1.49
24	EBP	Parent-Implemented Intervention	2.19	1.41
16	EBP	Functional Behaviour Assessment	2.17	1.33
13	EM	Exposure	2.16	1.33
23	EBP	Naturalistic Interventions	2.11	1.38
33	EBP	Social Narrative	1.92	1.37
5	EBP	Behavioural Momentum Intervention	1.84	1.35

18	UN	Holding Therapy	1.71	1.447
32	UN	Sensory Diet	1.70	1.46
4	EBP	Ayres Sensory Integration	1.64	1.429
22	EBP	Music-Mediated Intervention	1.58	1.42
2	UN	Auditory Integration Training	1.32	1.431
40	UN	Weighted Vests/Clothing	1.3	1.374
19	EM	Matrix Training	1.18	1.39
6	UN	Brushing/Wilbarger Protocol	0.92	1.263

Note. The items are arranged in descending order of means.

Results show that teachers identified the following five teaching practices as the most familiar: Reinforcement (EBP, M=3.19), Prompting (EBP, M=3.09), Rapid Prompting Method (UN, M=2.93), Punishment (EM, M=2.93), and Direct Instruction (EBP, M=2.93). Three of these were evidence-based practices. Two unsupported teaching practices, Facilitated Communication (UN, M=2.75) and Multisensory were ranked lower. Overall, EBP items received higher mean scores compared to practices from other categories, while most unsupported practices ranked near the bottom, suggesting lower familiarity among teachers. Among the six least familiar practices, only one was evidence-based (Ayres Sensory Integration, M=1.81); the remainder comprised four unsupported practices and one emerging practice, Matrix Training (EM, M=1.38). For the ‘use’ scale, teachers identified almost the same five top practices as in the knowledge scale, with the exception of Punishment (Use, M=2.61).

The most frequently used practices were Reinforcement (EBP, M=3.14), Prompting (EBP, M=2.92), Extinction (EBP, M=2.79), Rapid Prompting Method (UN, M=2.75), and Direct Instruction (EBP, M=2.74). The least used practices were Brushing/Wilbarger Protocol (UN, M=0.92), Matrix Training (UN, M=1.18), Weighted Vests/Clothing (UN,

M=1.30), Auditory Integration Training (UN, M=1.32), and Music-Mediated Intervention (EBP, M=1.58). Overall, analysis of the knowledge and use scales demonstrated strongly similar results although the mean scores for the latter were lower across all practices.

5.2.3 Correlation between Knowledge and Use Scales

The correlation coefficient reflects the degree of association between variables but does not necessarily indicate causality (Sedgwick, 2012). The correlation coefficient aims to investigate "the degree to which the two variables are related, measure the strength of the relationship, and, with data above the nominal level, identify the direction of that association" (McNabb, 2015, p. 194). This study computed Pearson's correlation coefficient through SPSS to assess the strength of association between the knowledge and use scales (items of each category were calculated separately). Prior to conducting the analysis, assumptions of linearity and normality were verified. The results are shown in Table 5.7.

Table 5.7

Pearson's Correlation Coefficient between Knowledge and Use Scales

Scale Category	**r**
Knowledge and Use scales (EBP)	.80
Knowledge and Use scales (EM)	.76
Knowledge and Use scales (UN)	.81

Note. Correlations were calculated only between knowledge and use within the same teaching category.

The correlation coefficient (r) ranges from -1.0 to +1.0. The sign indicates the direction of the relationship, and the value indicates its strength: a value of zero indicates no linear association (Mahsin, 2022). All correlations between knowledge and use scale scores were statistically significant and strong. The positive values, approaching 1, suggest that the two scales covary in the same direction. In other words, teachers who reported greater

familiarity with one type of practice were also more likely to report using it. Across all three categories, the results indicate that more than 60% of the variance in one variable can be explained by the other.

5.2.4 Comparison of Teaching Practice Categories in Knowledge and Use Scales

This section compares the overall mean scores of each teaching category across all participants (N=106). Comparisons were conducted between the sub-scales (EBPs, EM practices and UN practices) within the same scale.

Repeated measures ANOVA (RM- ANOVA) was used for this analysis because it is appropriate for comparing three or more means from the same sample (teachers) under different conditions or measurements (teaching practice categories). The purpose of ANOVA is to evaluate whether the means of different conditions differ significantly and to test the null hypothesis that all groups are drawn from populations with equal means. Standard ANOVA techniques are not suitable for complex comparisons of group means (Park et al., 2009). Therefore, the researcher employed RM-ANOVA because its analytical rigour and structured approach were well suited to the aims of the various statistical analyses. Prior to this, assumptions of normality and sphericity were confirmed for each condition (Roever & Phakiti, 2017).

Subsequently, the researcher computed RM-ANOVA to provide statistical data about the differences between condition means and the magnitude of these differences. After running RM-ANOVA, the Omega Squared was computed to determine the practical significance. The Omega Squared ($\omega 2$) is an effect size measure that aims to estimate the proportion of variance in the dependent variable. This allows researchers to go beyond just rejecting the null hypothesis and provide a more comprehensive analysis (Okada, 2013).

However, the RM-ANOVA does not identify which means differ (Park et al., 2009; Stockemer et al., 2019). According to McNabb (2015), “the p-value of the F-ratio will

indicate whether the null hypothesis is to be rejected, but it will not indicate where the differences lie" (p. 139). Therefore, the researcher conducted post-hoc analyses for this purpose (Park et al., 2009). These Post hoc comparisons used the Holm-Bonferroni correction and Cohen's d is used to measure the effect size; values are considered as small (~0.2), moderate (~0.5), and large (~0.8) (Hedrih & Hedrih, 2022). The results of these comparisons are presented in Tables 5.8 and 5.9.

Table 5.8

Comparisons of Teaching Subcategories Using Repeated Measures ANOVA

Within-Scale Comparison	**F Value**	**Sig.**	**Omega squared**	**Post hoc**
Knowledge of EBPs Knowledge of EM practices Knowledge of UN practices	43.44	p<.01	.04	Presented in the next table
Use of EBPs Use of EM practices Use of UN practices	65.19	p<.01	.06	

Note. A p-value less than 0.05 indicates statistical significance.

Table 5.9

Post Hoc Comparisons Between Teaching Categories Within Each Scale

First variable	**Second variable**	**Cohen's d**	**Sig.**
Knowledge of EBPs	Knowledge of EM practices	0.32	p<.01
Knowledge of EM practices	Knowledge of UN practices	0.20	p<.01

Knowledge of UN practices	Knowledge of EBPs	0.52	p<.01
Use of EBPs	Use of EM practices	0.32	p<.01
Use of EM practices	Use of UN practices	0.31	p<.01
Use of UN practices	Use of EBPs	0.64	p<.01

Note. Post hoc comparisons were conducted only after RM-ANOVA indicated statistically significant differences between teaching practice categories.

The RM-ANOVA analysis and post hoc tests indicate that all variances between score means of teaching practices categories are statistically significant. In the RM-ANOVA analysis, the exceptionally high F values for the knowledge (43.44) and the use scale subcategories (65.19) suggest a substantial difference between variables, which are not likely to a consequence of random variations. When examining the statistical significance, the P value below .01 indicates that the null hypothesis should be rejected and indicates that the difference is statistically significant, with less than a 1% chance that the difference between means occurred accidentally. Using omega squared, the effect size (knowledge scales, $\omega 2 = .04$) and (use scales, $\omega 2 = .06$) was found to be small.

Post hoc comparisons using the Holm-Bonferroni correction revealed significant differences among all compared teaching practice variables, with statistically significant differences defined at the $p \leq .05$ level. When examining the knowledge and use scales separately, EBPs had the highest mean scores, followed by emerging practices, while

unsupported practices scored the lowest in both scales. The largest differences were observed between the use of EBPs and unsupported practices (Cohen's d = 0.64, p<.01), followed by the knowledge scores for the same categories (Cohen's d = 0.52, p<.01). Differences between emerging and evidence-based practices, as well as emerging and unsupported practices, were smaller but still statistically significant (Cohen's d = 0.20 to 0.32, p<.01).

5.2.5 Scope of Quantitative Comparison

The analysis of item responses across the selected demographic factors was conducted using two approaches. The first approach examines teachers' responses to individual teaching practices, such as comparing male and female teachers' ratings of Direct Instruction or Reinforcement. Each teaching practice was analysed separately for both the knowledge and use scales. The second approach evaluates the average mean scores of each teaching category (i.e., EBPs, EM and UN practices) across different demographic groups in both scales. The results section presents the findings in order, starting with comparisons for specific teaching practices, followed by comparisons across teaching practice categories.

Multiple statistical comparisons were conducted to address the second research question, examining differences, similarities and potential trends in teachers' reported knowledge and use of teaching practices. Although the demographic section of the survey collected data on personal, professional, geographic and socioeconomic factors, the statistical analysis only included gender, employer and years of experience. These factors were selected because they are likely to reflect distinct contexts, such as teaching in either male or female schools, or in private or public schools. Priority was also given to years of experience, as this is acknowledged as a key predictor of performance (Campion et al., 1994). Information on the selected demographic factors is presented in Table 5.10.

Table 5.10

Distributions of Selected Demographic Factors

Factor	**Variables (Frequency and Percentage)**		
Gender	Male	Female	
	59 (56%)	47 (44%)	
Employer	Government	Private	
	85 (80%)	21 (20%)	
Years of Experience	Under 5 years	From 5 to 15 years	16 years and more
	27 (26%)	69 (56%)	10 (9%)

5.2.6 Gender Comparison in Ratings of Teaching Practices

The demographic data show that male teachers (N=59, 56%) comprised a larger proportion of survey participants than female teachers (N=47, 44%). Tables 5.11 and 5.12 present comparisons across individual teaching practices and across broader teaching practice categories, respectively.

Table 5.11

Comparison of Male and Female Teachers' Ratings of Specific Teaching Practices (Statistically Significant Items Only)

Teaching	**Male**		**Female**		**Statistical Comparisons**		
Practices	Mean	Std. Deviation	Mean	Std. Deviation	t	Sig.	Cohen's d
Knowledge – Evidence-based Practices							
Direct Instruction	2.51	1.41	3.02	1.24	-1.96	0.05	-0.38
Discrete Trial	2.42	1.37	3.04	1.18	-2.46	0.02	-0.48

Use – Emerging Practices							
Exposure	1.93	1.26	2.45	1.38	-2.00	0.05	-0.39

Note. A full statistical comparison of specific teaching practices for the knowledge and use scales is provided in Appendix O.

Comparative analysis of the 40 teaching practices in the knowledge scale revealed almost no significant difference between male and female teachers. Nevertheless, it appears that female teachers reported slightly higher use of two EBPs: Direct Instruction (M=3.02, SD = 1.24) and Discrete Trial (M = 3.04, SD = 1.18), as well as one EM practice: Exposure (M = 2.45, SD = 1.38) moderately more than male teachers. These differences were statistically significant at the $p \leq 0.05$ level. Cohen's d indicated that differences in the knowledge about Direct Instruction and Discrete Trial, and the use of Exposure are low to moderate. Markedly, the negative signs of Cohen's d statistics indicate that in this comparison, the male group's means are lower than those of the female group.

Table 5.12

Comparison of Male and Female Teachers' Responses Across Teaching Practice Categories

Scales and Teaching Practice Categories	**Male**		**Female**		**Statistical Comparisons**		
	Mean	Std. Deviation	Mean	Std. Deviation	t	sig.	Cohen's d
Knowledge - Evidence-based practices	2.58	1.05	2.68	1.03	-0.49	0.63	-0.10
Knowledge - Emerging Practices	2.31	1.05	2.30	0.95	0.03	0.98	0.01
Knowledge - Unsupported Practices	2.11	0.97	2.10	0.98	0.09	0.93	0.02
Use - Evidence based practices	2.31	0.92	2.50	0.92	-1.08	0.28	-0.21

Use - Emerging Practices	2.01	1.00	2.18	0.97	-0.87	0.39	-0.17
Use - Unsupported Practices	1.81	0.94	1.77	0.90	0.24	0.81	0.05

Note. Statistical significance was defined at p≤.05.

The mean scores for male and female teachers across all teaching categories show minimal differences. In the knowledge scale, the means for the Emerging Practices (Male: M=2.31; Female: M=2.30) and Unsupported Practices categories (Male, M=2.11; Female, 2.10) were nearly identical. These negligible differences contributed to the t-test results, none of which were statistically significant. Accordingly, the null hypothesis was not rejected, meaning that there were no significant gender differences in knowledge or use across the categories.

5.2.7 Comparison of Public and Private School Teachers' Ratings of Practices

Teachers from public schools comprised the majority of the sample (85 from public schools, 21 from private schools). Since there may be differences between the sectors in relation to teachers' years of experience, licensing requirements, and access to training and resources, it was important to compare public and private teachers' ratings of teaching practices. Tables 5.13 and 5.14 show the results, respectively, for comparisons across individual teaching practices and across teaching practice categories by school sector.

Table 5.13

Comparison of Public and Private School Teachers' Ratings of Specific Teaching Practices (Statistically Significant Items Only)

Teaching Practices	**Public**		**Private**		**Statistical Comparisons**		
	Mean	Std. Deviation	Mean	Std. Deviation	t	Sig.	Cohen's d
Knowledge – Evidence-based Practices							

Music-Mediated Intervention (K)	1.86	1.50	2.86	1.28	-2.81	0.01	-0.69
Knowledge – Unsupported Practices							
Auditory Integration Training (K)	1.72	1.42	2.52	1.37	-2.35	0.02	-0.57
Use – Evidence-based Practices							
Behavioural/Instructional Strategies (U)	2.18	1.36	2.90	1.30	-2.22	0.03	-0.54
Music-Mediated Intervention (U)	1.36	1.34	2.48	1.44	-3.37	p<.01	-0.82
Use – Emerging Practices							
Exposure (U)	2.02	1.28	2.71	1.42	-2.17	0.03	-0.53

Note. A full statistical comparison of specific teaching practices for the knowledge and use scales is provided in Appendix P.

Statistically significant mean differences in knowledge and use were identified for five teaching practices across both scales. Private school teachers reported greater knowledge of Music-Mediated Intervention ($p = 0.01$) and Auditory Integration Training ($p = 0.02$) than public school teachers, although the effect sizes were moderate (Cohen's $d = -0.69$ and -0.57, respectively). On the use scale, private school teachers rated two EBPs (Cognitive Behavioural/Instructional Strategies and Music-Mediated Interventions) higher than their public-school counterparts. Exposure was the only teaching practice in the EM category to show a significant difference, also in favour of private school teachers. Notably, the effect size for Music-Mediated Intervention use was large, whereas the other two practices showed moderate differences.

Table 5.14

Comparison of Teaching Practice Categories by Employer Type

	Public Sector		**Private Sector**		**Statistical Comparisons**		

Teaching Practice Categories	Mean	Std. Deviation	Mean	Std. Deviation	t	sig.	Cohen's d
Knowledge - Evidence-based Practices	2.59	1.05	2.79	0.98	-0.82	0.41	-0.20
Knowledge - Emerging Practices	2.25	1.00	2.55	1.01	-1.23	0.22	-0.30
Knowledge - Unsupported Practices	2.05	0.98	2.31	0.92	-1.08	0.28	-0.26
Use - Evidence based Practices	2.36	0.94	2.53	0.84	-0.76	0.45	-0.19
Use - Emerging Practices	**1.99**	**0.98**	**2.46**	**0.95**	**-1.98**	**0.05**	**-0.48**
Use - Unsupported Practices	1.74	0.94	2.00	0.81	-1.15	0.25	-0.28

Note. Statistical significance was defined at $p \leq .05$.

When comparing teachers by employer type, the mean differences across teaching categories were greater than those observed in the gender comparison. However, only the use of Emerging Practices was found to differ significantly by employer type. The mean score of public-school teachers was lower (M = 1.99, SD = 0.98) than that of their private school counterparts (M = 2.46, SD = 0.95). This difference was statistically significant, t = -1.98, p = 0.05; the effect size was medium (Cohen's d = -0.48). None of the other comparisons reached statistical significance.

5.2.8 Comparison in Ratings of Teaching Practices by Years of Experience

This section presents the results of comparing years of teaching experience in relation to knowledge and use of teaching practices. For analysis, the four original response options for years of experience were collapsed into three categories: The groups “16-25 years” (n = 9) and “more than 25 years” (n=1) were combined into a single category of “16 years or more” (n=10). Collapsing categories is a common statistical practice (Van Dusen & Nissen, 2020) and was applied here to balance group sizes and enable meaningful comparisons, which would not have been possible with a category containing only one participant. The demographic breakdown showed that teachers with fewer than 5 years of experience represented about one-quarter of the sample (N = 27, 26%), while the majority had between 5 and 15 years of experience (N= 69, 56%). The smallest group comprised teachers with 16 years or more of experience (N = 10, 9%). Tables 5.15 and 5.16 present the comparison results across these experience levels in relation to teaching practices.

Table 5.15

Comparison of Teachers' Ratings of Specific Teaching Practices by Experience Level (Statistically Significant Items Only)

Teaching Practices	Under 5 years		From 5 to 15 years		16 years and more		Statistical Comparisons			
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	F	sig.	Omega square	Post hoc
Knowledge – Evidence-based Practices										
Modelling (K)	2.44	1.50	3.16	1.12	2.60	1.43	3.52	0.03	0.05	(5-15 higher than Under 5, d=-0.57, p=0.04)
Extinction (K)	2.15	1.68	3.10	1.23	2.70	1.16	4.88	0.01	0.07	(5-15 higher than Under 5, d=-0.71, p=0.01)
Task Analysis (K)	2.11	1.58	2.99	1.12	2.60	1.27	4.71	0.01	0.07	(5-15 higher than Under 5, d=-0.69, p=0.01)

Antecedent-based Intervention (K)	2.19	1.30	2.90	1.06	2.90	1.29	3.90	0.02	0.05	(5-15 higher than Under 5, d=-0.62, p=0.02)
Functional Communication Training (K)	1.96	1.63	2.80	1.23	2.40	1.27	3.79	0.03	0.05	(5-15 higher than Under 5, d=-0.62, p=0.02)
Knowledge – Unsupported Practices										
Facilitated Communication (K)	2.30	1.61	3.00	1.26	2.20	1.48	3.40	0.04	0.04	(5-15 marginally higher than Under 5, d=-0.51, p=0.08)
Use – Evidence-based Practices										
Direct Instruction (U)	2.33	1.54	3.00	1.19	2.00	1.49	4.22	0.02	0.06	(5-15 marginally higher than Under 5, d=-0.51, p=0.08, and 16 years or

										more, d=0.76, p=0.08)
Modelling (U)	2.15	1.51	3.01	1.02	2.20	1.32	6.20	p<0.01	0.09	(5-15 higher than Under 5, d=-0.73, p=0.01)
Discrete Trial Training (U)	2.22	1.58	2.96	1.09	2.20	1.62	4.02	0.02	0.05	(5-15 higher than Under 5, d=-0.57, p=0.04)
Visual Supports (U)	2.07	1.64	2.81	1.12	2.20	1.40	3.60	0.03	0.05	(5-15 higher than Under 5, d=-0.57, p=.04)
Task Analysis (U)	1.93	1.41	2.93	1.06	2.50	1.18	7.18	p<0.01	0.11	(5-15 higher than Under 5, d=-0.86, p<.01)
Functional Communication Training (U)	1.70	1.64	2.58	1.28	2.20	1.14	4.04	0.02	0.06	(5-15 higher than Under 5, d=-0.64, p=0.02)

Time Delay (U)	1.70	1.24	2.45	1.30	2.20	1.23	3.31	0.04	0.04	(5-15 higher than Under 5, d=-0.58, p=0.04)

Note. A full statistical comparison of specific teaching practices for the knowledge and use scales is provided in Appendix Q.

The ANOVA and post-hoc analyses revealed 10 teaching practices in the knowledge and use scales with statistically significant differences across teachers with varying years of experience. On the knowledge scale, teachers with 5 - 15 years of experience reported moderately higher knowledge than those with fewer than 5 years of experience in five EBPs (Modelling, Extinction, Task Analysis, Antecedent-based Intervention, Functional Communication Training). The effect sizes for these practices were moderate, ranging from d = .57 to d = .71.

For Facilitated Communication (UN practice, knowledge) and Direct Instruction (EBP, use) ANOVA indicated significant group differences; however, follow-up t-tests did not reach the conventional significance threshold (p=.08). The small group sizes may have contributed to this outcome. Nonetheless, Cohen's d suggested moderate to large effects (d = 0.51 to 0.76).

In relation to use, teachers with 5 - 15 years of experience reported employing several EBPs (Modelling, Discrete Trial Training, Visual Supports, Task Analysis, Functional Communication Training, and Time Delay) more frequently than teachers with under 5 years of experience. The mean differences for these six practices were statistically significant and of moderate to large magnitude.

Table 5.16

Comparison of Teaching Practice Categories by Years of Experience

Teaching Practice Categories	**Under 5 years**		**From 5 to 15 years**		**16 years and more**		**Statistical Comparisons**			
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	F	sig.	Omega square	Post hoc
Knowledge - Evidence-based Practices	2.29	1.27	2.79	0.90	2.44	1.03	2.48	0.09	0.03	
Knowledge - Emerging Practices	2.05	1.22	2.43	0.90	2.18	0.96	1.52	0.23	0.01	
Knowledge - Unsupported Practices	1.93	1.18	2.22	0.88	1.80	0.87	1.45	0.24	0.01	
Use - Evidence based Practices	**2.06**	**1.14**	**2.56**	**0.77**	**2.15**	**1.01**	**3.42**	**0.04**	**0.04**	**(5-15 higher than Under 5, d=-0.56, p=0.05)**
Use - Emerging Practices	1.89	1.19	2.17	0.89	2.05	1.06	0.79	0.46	0.00	

Use - Unsupported Practices	1.59	1.03	1.90	0.84	1.63	1.06	1.33	0.27	0.01

Note. Statistical significance was defined at .05.

The ANOVA results showed no statistically significant differences across teaching practice categories, except for the use of EBPs ($p = 0.04$). The effect size, as measured by omega squared, was very small ($\omega 2 = .04$). Post hoc comparisons indicated that the significant difference occurred between teachers with 5 - 15 years of experience and those with less than 5 years. Specifically, teachers with 5 - 15 years of experience reported moderately greater use of EBPs (Cohen's $d = -0.56$).

Chapter 6: Qualitative Component: Data Analysis and Results

This section describes the method of analysing the qualitative data and presents the results of that analysis. The aim of the qualitative component of this study was to identify the barriers to EBP implementation and to explore the facilitators that promote EBP use among Saudi Arabian teachers. The data obtained from the focus group discussions authentically reflect teachers' perspectives and experiences of EBP implementation in their classrooms.

The investigation at this stage was driven by the Action Cycle (Graham et al., 2006), which aims in its second and third phases to investigate contextual barriers and facilitators of EBPs among teachers of students with autism. The use of focus groups as a data collection method has a strong reputation for highlighting collective needs and allowing dynamic interactions (Morgan & Hoffman, 2018a). Therefore, this study utilised a qualitative method aligned with the aim of the study and the selected theoretical framework. Specifically, it allowed to address the following questions:

- What do teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs?
- What strategies do teachers of students with autism in Saudi Arabia recommend for supporting the implementation of EBPs?

This chapter details the processes of data analysis and presents the results of the focus group discussions. The first section justifies the use of reflexive thematic analysis (TA) and explains the procedures adopted to ensure the trustworthiness of the findings. The process of analysis is described in detail. The second part of this chapter presents the results, including the developed themes and a brief description of demographic information and context. Each developed theme is considered in relation to its definition and central organising idea, with the interpretation supported by verbatim extracts from the data.

6.1 Method of Analysis

A variety of methods for analysing qualitative data are available (Braun & Clarke, 2022). The type of research question that needs to be answered, the aims of the research project, the theoretical framework orientation, and practical considerations of time and resources can all determine the choice of a particular method in a research project (Plummer-D'Amato, 2008b). These different methods are used in qualitative research for one or more of these three reasons: "(1) to define concepts; (2) to explain a specific aspect of an earlier study that is not clear, or (3) to build theory" (Douglas, 2022, p. 427).

6.1.1 Reflexive Thematic Analysis

Thematic analysis (TA) is one of the qualitative methods that has acquired credibility and popularity among qualitative researchers over the last two decades (Naeem et al., 2023). The TA was initially negatively compared with already established techniques; however, an established body of literature has indicated that TA has now become one of the most recognised and frequently used qualitative analysis methods (Clarke & Braun, 2013).

TA is defined as a method "for developing, analysing and interpreting patterns across a qualitative dataset, which involves systematic processes of data coding to develop themes – themes are your ultimate analytic *purpose*" (Braun & Clarke, 2022, p. 4). This study employed reflexive TA to analyse and interpret the data (Braun & Clarke, 2022). Braun and Clarke (2022) apply the term *reflexive* to their TA method to distinguish it from other approaches, such as grounded theory and content analysis (see e.g. Boyatzis, 1998). The term reflexive emphasises the value of the researcher's subjectivity and the contribution of her or his conscious and self-referential engagement with the process of identifying themes in the data. In the present study, reflexive TA was selected because it provided three main benefits, as elaborated below.

Reflexive TA supports *subjectivity* and establishes trust to examine the researcher's biases and assumptions continuously. As Braun and Clarke (2022) argue, "the possibility of unbiased or objective knowledge generation, and the potential to control such bias, make little sense within reflexive TA" (p. 8). Accepting and adopting subjectivity was, at first, a mental challenge that led to excitement, which motivated the researcher to discover reflexive TA and then employ it to analyse the qualitative data. Importantly, reflexive TA was suitable for this study because it allowed the researcher to uncover underlying meaning related to the Saudi context.

Flexibility was another reason for selecting reflexive TA for this research study. Reflexive TA is not tied to a specific theoretical framework or philosophical position. Therefore, a qualitative researcher can adapt reflexive TA in alignment with broad qualitative research paradigms to answer various research questions. The flexibility of reflexive TA also includes ways of identifying codes and creating themes. Braun and Clarke (2022) stress that "coding doesn't have to be either inductive or deductive, although it can be; your analysis can have elements of both orientations. What's most important is that your coding orientation fits your purpose" (p. 56). In contrast, other qualitative analytical methods, such as content analysis, rely on predetermined codes or themes.

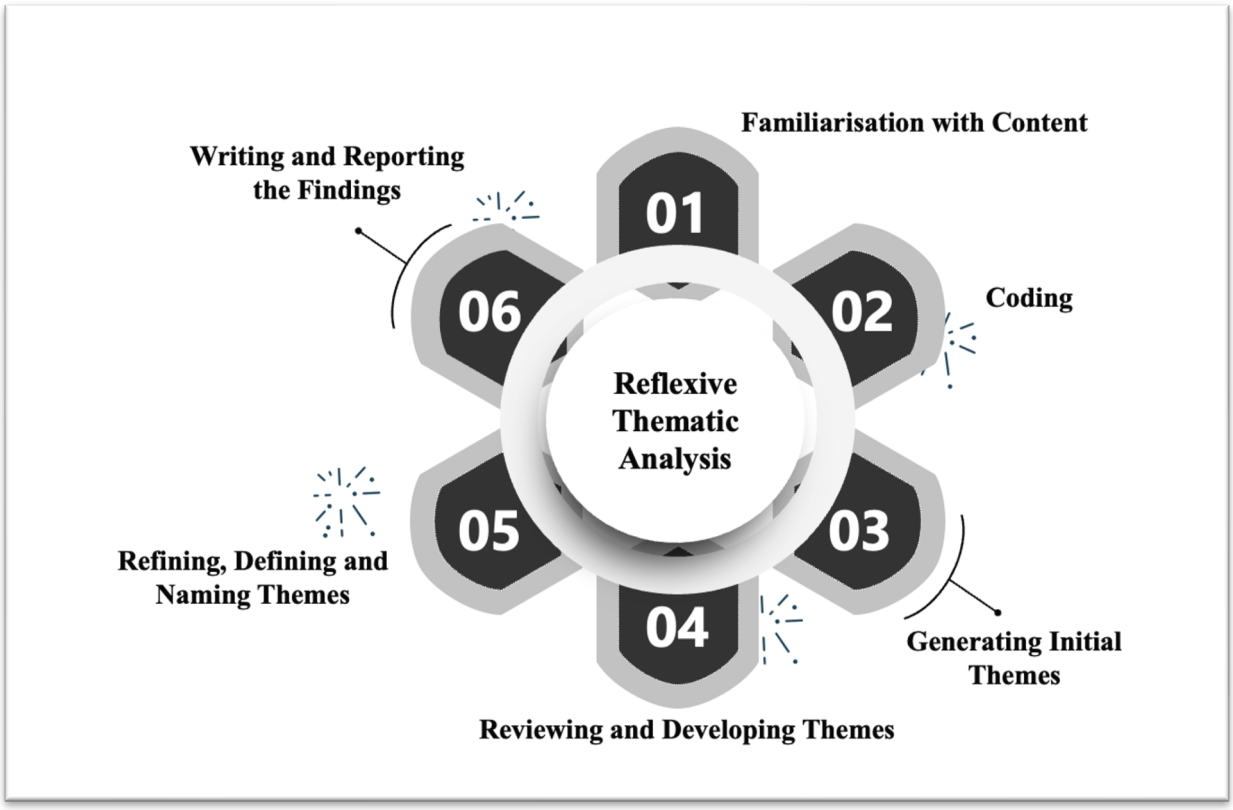
Finally, reflexive TA offers an *organic*, spontaneous and less rigid approach to identifying and developing codes and themes. The deductive analysis approach in Braun & Clarke's (2022) reflexive TA urges the qualitative researcher to tolerate ambiguous data and deal with uncertainty. Moreover, iterative and non-linear processes of reflexive TA can enhance the quality and trustworthiness of the research findings because "quality depends not on notions of consensus, accuracy or reliability, but on immersion, creativity, thoughtfulness, and insight" (Braun & Clarke, 2022, p. 268).

6.1.2 Procedure

Reflexive TA was used in this study to analyse the data from 12 FG meetings conducted in six different school sites in Saudi Arabia (See Appendix R). The researcher followed the reflexive TA guidelines outlined by Braun and Clarke (2022), as illustrated in the six analysis phases presented in Figure 6.1 below.

Figure 6.1

The Six Phases of Reflexive Thematic Analysis as Identified by Braun and Clarke (2022)



Note. More details about each of these phases are described below.

6.1.2.1 Familiarisation and Transcription

Data familiarisation takes place through the researcher's ongoing interaction with the data. This stands in sharp contrast to the analysis of data collected through a survey or other structured method (Braun & Clarke, 2022). Data familiarisation refers to the first interaction with the dataset and the process of becoming more acquainted with the collected information. Braun and Clarke (2022) recommend that qualitative researchers immerse themself in the

collected data through developing an intimate relationship while remaining critical during analysis procedures.

In this study, the researcher's first interaction with the data occurred during the FG meetings. As he moderated the discussions, he developed first impressions and observed patterns and codes that might be useful later. Initially, a transcription software tool (Microsoft Teams) was used to convert the audio-recorded data to written text. However, the software did not support the Arabic language, and the use of other advanced audio transcription software had not been ethically approved. Thus, the researcher transcribed the data manually. This proved to be a challenging and time-consuming process, but it had the advantage of providing an excellent opportunity for data familiarisation. After all the data had been transcribed verbatim, the transcription was checked against the recordings to identify any words or phrases that had been missed or misheard. The researcher then listened to the audio-recorded data a third time to distinguish his questions and prompts from participants' responses. These steps in transcription played a vital role in data familiarisation.

The written materials were subsequently read independently from the original audio records, typed in Microsoft Word and formatted into tables, where the first column contained the raw data and the second column contained the researcher's notes. At this stage, the researcher engaged closely with the transcripts, reading them repeatedly, questioning his assumptions and positions, and documenting his observations. Only the two meetings from one FG were read per day to ensure clarity and maintain analytic quality. Some additional notes were taken during the transcription process; however, at this point, it was only possible to reflect on the data and record basic relationships and patterns.

Researcher notes included interesting quotes and preliminary ideas that appeared relevant to the research questions or raised issues around the researcher's reflexivity. Importantly, the researcher sought to adopt a dual approach to data engagement, that is, "a

way of reading the data that involves both closeness and familiarity (immersion) and distance (critical engagement)" (Braun & Clarke, 2022, p. 43). Immersion in the data allowed the researcher to generate a rich, context-related outline, while the adoption of a critical stance allowed assumptions to be re-examined in an iterative process.

6.1.2.2 Coding

In reflexive TA, codes represent the smallest unit of analysis, each of which captures an insight or a piece of information that later contributes to answering the research question (Braun & Clarke, 2022). As Braun and Clarke (2022) suggest, "familiarisation is engaged-but-not-yet-systematic, coding is engaged-and-systematic" (p. 53).

Codes in qualitative analysis serve two purposes. When a researcher conducts, for example, an interview or FG discussion with an open-ended question, a large volume of data is always expected to be gathered and analysed. Subsequently, these codes, when created and labelled, can facilitate the identification of key patterns and initial themes (Braun & Clarke, 2022). In reflexive TA, coding involves careful reading of the data to highlight or tag relevant text segments and assign code labels to each segment. Segments of data that do not contribute to answering the research questions are discarded. Braun and Clarke (2022) state that "for reflexive TA, we do not advocate line-by-line coding in the traditional, grounded theory-developed sense of coding each single line of text. Instead, you only need to code data relevant to the research question – broadly framed" (p.54).

Individual codes carry no more than one idea: "codes are not themes, and so you're trying to capture a singular or particular idea through coding, not a multi-faceted one" (Braun & Clarke, 2022, p. 54). A code can be a few words, a paragraph, or a longer segment of text. The researcher occasionally found off-topic and irrelevant segments, which were ignored. Some longer segments were coded with one overreaching label to capture the meaning of the

whole text. On the other hand, some segment texts were rich in meaning and reflected multiple ideas, which required assigning multiple codes.

The process of coding is iterative and non-linear, allowing the researcher to go back and forth to continually check the suitability of the assigned code, the specificity of meaning in each identified segment, and the appropriateness of the code labels. All datasets were coded using identical procedures, regardless of their position in the sequence of analysis. In order to maintain focus and consistent effort across all datasets, the researcher worked in a one-hour coding session and then stepped away for a few minutes before proceeding to the next segment in the dataset.

An inductive, data-driven analytic strategy was employed in the initial coding process. This aligned with the constructivist approach which, as discussed earlier, underpinned the design of the qualitative component of the study. This approach aims to explore how individuals make meaning of a phenomenon through interaction in a particular socio-cultural context. Hence, the aim of the coding process was to capture teachers' experiences and perspectives in relation to the challenges that inhibit the use of EBPs and potential solutions, rather than to seek the 'truth' about the phenomenon. As such, the analysis can be described as based on inductive reasoning. However, it is important to bear in mind that, as Braun and Clarke (2022) point out, "the subjective and embedded process makes pure induction impossible: we bring with us all sorts of perspectives, theoretical and otherwise, to our meaning-making" (Braun & Clarke, 2022, p. 56).

Braun and Clarke (2022) define semantic coding as staying on the surface, while latent coding allows researchers to find the deep and the underlying meaning. Analysis in this research study includes both semantic and latent levels of coding. During the initial stages of coding, semantic codes predominated, with subsequent rounds of coding generating deeper

conceptual meanings. Hence, the final coding stage yielded a more robust analysis that emphasised semantic-level codes.

The data were coded using Microsoft Word; no qualitative analysis software was employed. Features such as highlighting, underlining, strikethrough and comments were utilised to flag segments and generate code labels. Since the FG data were recorded in Arabic, codes were generated from these transcripts. Analysing the data in its original language is important for maintaining the integrity of participants' voices and for understanding idiomatic cultural expressions and phrases (Dolan et al., 2023). In the first round of coding, hundreds of codes were identified. These codes were refined multiple times, and labels were reviewed to ensure they were descriptive, precise and carried only one idea.

6.1.2.3 Generating Initial Themes

Reflexive TA coding is a continuous process, and the decision to stop coding is based on the extent to which the researcher is convinced no more codes are emerging. In this regard, Braun and Clarke (2022) advise the researcher to stop coding when reaching "the point when you're just tweaking your codes and coding labels" (p. 71). In this section, the term generating or developing themes is used instead of searching for themes. Braun and Clarke (2022) state that "themes do not passively emerge from either data or coding; they are not 'in' the data, waiting to be identified and retrieved by the researcher" (p. 591).

The developed codes were transferred into a new file and carefully reviewed to identify potential themes. This involved examining relationships between codes to identify commonalities and generate an overall perspective on the entire dataset. This phase prioritised looking for patterns in the data and gradually categorising codes into provisional themes. Although the process of generating themes involves dealing with a much smaller volume of data than does initial coding, it is no less demanding since it focuses on finding the common denominator among multiple facts or ideas, whereas codes only centre on a single

idea. Braun and Clarke (2022). Potential themes were generated with the help of Microsoft Word features and PowerPoint. For example, the codes were first categorised by colour, and then visually represented in charts to highlight relationships between themes.

Themes were developed in two stages, initially within each FG and subsequently across all FG discussions. The themes generated from the first stage were only used to compare the data extracted from the male group to that from the female group. During this process, a number of preliminary themes were merged with other themes or were removed. Before moving to the next phase, the researcher employed thematic evaluation questions suggested by Braun and Clarke (2022) to assess whether the developed themes were coherent, captured the central idea and established clear boundaries. At this point, all the themes were only considered as candidate themes, and potentially subject to modification as richer analytic insights were subsequently obtained.

6.1.2.4 Reviewing and Developing Themes

One of the fundamental features of reflexive TA is its gradual processes and iterative nature. Therefore, initial themes must evolve stepwise to avoid premature or shallow data analysis. Braun and Clarke (2022) caution qualitative researchers that "a 'quick and dirty' analysis can result in analytic foreclosure – stopping analysis after an only superficial engagement with the data and producing a set of themes that don't realise the full potential of the data" (p. 54). Therefore, Braun and Clarke (2022) rename this phase *developing* themes instead of the original *reviewing* themes to indicate that researchers should continue developing themes and not only check the suitability of the existing ones. They identify recursivity as the main feature of this phase, which is accomplished by revisiting codes, refining thematic mapping and generating new themes. As previously mentioned, they characterise the initial themes developed during the previous phase as candidate themes,

which need to be refined to improve their accuracy and representativeness in relation to the dataset as a whole.

As such, the codes assigned to each theme were critically reviewed to identify those that might need to be reclassified into newly developed themes. This phase was guided by the reflective questions suggested by Braun and Clarke (2022). For example, did some themes overlap or share an identical core point? As a result, several themes were combined, and some new or sub-themes were developed. As these authors remark, “good themes are distinctive and, to some extent, stand-alone” (p. 84). Simultaneously, each theme was closely examined to determine if it supported the core idea and aligned with the study’s research questions. In a second round, codes that had not previously been categorised into meaningful themes were reviewed. Many of these codes remained uncategorised because they did not form a coherent theme or contribute to answering the research questions. In reflexive TA, it is common for some codes to remain unused: “initial (and indeed final) themes do not have to capture everything in the dataset, or indeed all the codes that you have developed” (Braun & Clarke, 2022, p. 88).

As the boundaries between themes became more defined, some themes were discarded when found to be incoherent, irrelevant or redundant. The researcher’s deep engagement with the data during this stage facilitated the development of themes based on meaning and patterns rather than frequencies. Thematic mapping was an essential tool in this phase that assisted the researcher in organising overlapped themes. Moreover, the researcher also avoided creating multiple levels of themes. According to Braun and Clarke (2022), “more layers of theme level do not usually make a better analysis; indeed, they often mean a thinner, poorer and underdeveloped one” (p. 86). Finally, reviewing and refining data in this phase resulted in more coherent and distinct themes that captured nuanced insight to address the research questions.

6.1.2.5 Refining, Defining and Naming Themes

Although themes continued to be revised and improved during this phase, greater effort was directed toward defining and naming themes and organising them into a coherent reporting structure. A few new themes were formulated in this phase. Established themes were reviewed to ensure they were internally consistent and had well-defined boundaries. Following Braun and Clarke (2022), the researcher used definitions as testing tools to determine the quality of a theme in relation to the clarity of its core concept. The definitions developed in this study comprised a concise theme name, a few sentences capturing its central idea, and information about boundaries, context and potential connections.

Clearly articulated boundaries are important for delineating what is included or excluded within each theme. Context helps to establish the relatedness of a theme to the overall research questions. The supervisory team thoroughly reviewed the final themes and their definitions to ensure that they effectively addressed the research questions and were based on a unique central organising idea.

The careful consideration given to naming themes in this study is grounded in the understanding that poorly named themes can lead to misrepresentation of their core meaning. Braun and Clarke (2022) advise that names should be concise but should not comprise a single word, since one word cannot capture the patterning of meaning.

6.1.3 Quality Assessment

The scientific rigour of qualitative research has been criticised for failing to capture and confirm the validity, reliability and generalisability of the obtained data (Adler, 2022; Ahmed, 2024). Even though these criteria are considered fundamental quality indicators in quantitative research, many researchers have questioned their suitability for the qualitative research paradigm (Plummer-D'Amato, 2008b; Shenton, 2004). Lincoln and Guba (1985)

proposed trustworthiness as an alternative concept for evaluating qualitative research. They identify four key criteria for assessing trustworthiness: credibility, dependability, transferability and confirmability.

6.1.4 Trustworthiness Measures in this Study

As noted above, the first step toward generating trustworthy qualitative findings is to develop a rigorous research design. This study was carefully designed under the guidance of the supervision team. It was also approved by the thesis proposal committee at the University of Sydney and the Human Research Ethics Committee. Contextually appropriate focus group questions were developed, and numerous precautions were taken to avoid common threats to data credibility, such as censoring and conformity (Plummer-D'Amato, 2008b).

The Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007) was used to provide a detailed description of data collection and analysis procedures. In this method, researcher's subjectivity is not perceived as a threat to confirmability: "the possibility of unbiased or objective knowledge generation, and the potential to control such bias, make little sense within reflexive TA" (Braun & Clarke, 2022, p. 9). Table 6.1 summarises the strategies and procedures employed in this study to meet each of the four trustworthiness criteria. The second section of this chapter presents the results of the analysis.

Table 6.1

Summary of Procedures used to Enhance Trustworthiness

Trustworthiness Criterion	Procedures Adopted
Credibility	Careful selection of research methods. Site triangulation. Iterative questioning technique. Developing familiarity with participants.

	Reporting researcher background. Conducting more than one Focus Group. Creating homogeneous discussion groups. Appropriate storage of all raw data.
Dependability	Using COREQ to report data collection and analysis procedures. Traceable data collection and analysis procedures. Clear justification for methods of data collection and analysis. Ensuring alignment between methods, research questions and theoretical framework
Transferability	Detailed description of the data collection method, number and length of FG sessions and participants. Description of inclusion criteria for selecting participants and sites, mode of delivery and local context. Detailed description of the data analysis method, including steps in coding and developing themes.
Confirmability	Acknowledging the impact of personal assumptions and biases.

	Identification of the limitations of the methods of data collection and analysis. Employment of an inductive approach to coding development. Audit trail of coding and development of themes. Peer debriefing.

6.2 Results

6.2.1 Demographic Characteristics of FG Participants

Participants in the focus group discussions were all teachers of students with autism who work in schools located within Al-Ahasa in eastern Saudi Arabia. Participants ranged in age from 24-56 years, with the majority aged 30-49. This indicates a predominance of mid-career professionals in the sample. Initially, 59 teachers expressed their willingness to participate and signed consent forms; however, 17 subsequently decided to withdraw or missed one or two of the FG meetings. This resulted in a total of 42 teachers in attendance at the first FG meetings, and 39 at the second meetings. Table 6.2 summarises the schedule of meetings and the characteristics of participants.

Table 6.2

Schedule of Focus Group Meetings and Characteristics of Participants

	Gender	Employment Sector	Educational Setting	Number of Consents	First Meeting Attendance	Second Meeting Attendance
Focus Group (Cancelled)*	Male	Public School	Special Education Classroom	6	Cancelled	Not arranged
Focus Group (Cancelled)*	Male	Public School	Special Education Classroom	7	Not arranged	Not arranged
Focus Group 1	Male	Private School**	Special Education school for students with autism and other neurodevelopmental conditions	9	9	9
Focus Group 2	Male	Public School	Special education school	9	9	8
Focus Group 3	Male	Public School	Special education school for students with autism	6	6	6

Focus Group 4	Female	Public School	Special Education Classroom	7	5	4
Focus Group 5	Female	Public School	Special education school for students with autism	7	7	7
Focus Group 6	Female	Public School	Special education school for students with autism	8	6	5

*Teachers from the two cancelled meetings received the PIS and later signed the consent form. They withdrew from the study due to busy teaching obligations.

**As previously mentioned, only one private school agreed to participate.

6.2.2 Structuring and Writing the Results

The aim of the qualitative component of this study was to shed light on the shared experiences and perspectives of teachers regarding barriers to and facilitators of EBPs implementation. The findings are presented by theme. The central organising idea and boundaries of the theme are identified, together with an explanation of its relevance to the research questions.

The report of findings is presented in the form of an analytic narrative and supportive data excerpts. Some qualitative researchers choose to present themes in an order that enhances the flow of the story they want to tell, especially when themes seem to build on each other (Braun & Clarke, 2022). In this study, the order does not indicate a hierarchy of importance. However, all themes are considered equally important in providing a holistic understanding of the data in relation to the research questions.

Following Braun and Clarke (2022), no numerical data are included. They argue that relying on numbers to identify patterns represents "an implicit re-articulation of the idea that numbers are more precise and better than general descriptions" (p.141). This also aligns with the philosophical underpinnings of qualitative investigation (Maxwell, 2010). As such, reporting the frequency of themes may lead to the "logic where more is better" (Braun & Clarke, 2022, p. 141).

6.2.3 Barriers Identified in Response to the First Qualitative Research Question

The two research questions addressed in the qualitative component of the study were developed based on the idea that identifying barriers and facilitators as reported by teachers, who represent the end-users, can provide insight into the research-to-practice gap and enhance EBPs implementation in educational settings. The first question focused on what teachers report as societal, institutional and personal challenges that lie in the way of implementing EBPs in the autism classroom in Saudi Arabia. Teachers presented multiple

viewpoints reflecting their daily challenges in implementing EBPs, and obstacles were categorised as knowledge gaps and implementation difficulties. Table 6.3 shows the final themes developed for the first qualitative research question. Administrative and structural obstacles

Table 6.3

Themes Developed for the First Qualitative Research Question

Research Question	Developed Themes
What do teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs?	1. The university failed to prepare me 2. Failure to thrive in an ill-equipped classroom 3. Insufficient EBP knowledge 4. Administrative and structural obstacles

6.2.3.1 Theme 1: The University Failed to Prepare Me

This theme indicated that university curricula and pre-service training for teachers of students with autism in Saudi Arabia failed to equip them with the necessary knowledge and skills to utilise EBPs in the classroom. A very small minority of participants expressed the view that it is teachers' responsibility to independently pursue knowledge about EBPs after graduation in order to meet the practical demands of working with students with autism. The majority, however, agreed that inadequate university preparation was one of the key barriers restricting their ability to adopt EBPs when teaching students with autism.

Definition. This theme conveys teachers' dissatisfaction with their pre-service university programs. The misalignment between theoretical knowledge and real-world practice represents teachers' greatest disappointment. They report that the university

curriculum and field training failed to integrate practical school experiences and allow them to stay abreast of current EBPs research.

Central Organising Idea. The central idea in this theme is that special education programmes pay insufficient attention to the learning needs of students with autism. Participants reported that special education curricula in universities in the east of Saudi Arabia specifically address the needs of groups such as students with hearing impairment, visual impairment, or intellectual difficulties, but neglect students with autism. Further, they commented that none of the universities in this region offered an undergraduate programme specialising in autism. For example:

> The Eastern Province's universities in Saudi Arabia do not provide autism-specific programmes. So, when we met teachers from other regions, such as Riyadh, who are autism specialists and have behavioural training, [...] we benefited a lot from them. [FG4]

It is important to note that school placement for teachers in Saudi Arabia is based on the needs of each region. However, several participants indicated that poor coordination between universities and the Ministry of Education has led to a misalignment between university curricula and real-world demand:

> I did not have much idea about autism. They should have given me enough information about autism and the basics of teaching before placing me. Honestly, the first year of placement was really difficult. [FG4]

> My major was intellectual disabilities [….]; however, I was directed by the Ministry of Education to teach students with autism. I was surprised, honestly. I mean, how do I deal with my students? [FG5]

Supporting Ideas and Additional Evidence. This idea was backed up by additional evidence from the discussions, as teachers elaborated on the reasons for the failure of universities to equip them with the necessary knowledge and skills to adopt EBPs in classrooms.

The Curriculum Falls Short. As mentioned above, universities in eastern Saudi Arabia, from which most participants graduated, do not offer majors or minors specifically in autism. People in Saudi Arabia typically spend their entire lives near their homeland and family and ordinarily prefer to attend university and work in their city of origin. As a result, most teachers who participated in this study attended universities in the eastern region of Saudi Arabia. These universities offer only one course on autism or teach autism as part of other courses, such as introductory courses in special education:

> Our undergraduate courses concentrated only on intellectual disabilities, and we took one class about autism [...], but we did not explore it in depth and get a comprehensive idea about autism. [FG5]

However, even when autism-related content was taught, the coverage was superficial:

> The curriculum describes what autism is, its classifications and characteristics, but I need to know more about the EBPs. The teaching practices will benefit me. In the end, I do not want this theoretical focus. [FG2]

Teachers also highlighted the absence of curriculum content on applied behaviour analysis (ABA) techniques. These data-driven practices are employed to teach students with autism various skills, such as behavioural management, and to foster the acquisition of social and academic skills. All participants agreed that their university had not included training in

behavioural principles and behavioural intervention techniques in its special education curriculum:

> The university was supposed to provide more courses in behavioural modifications, behavioural training, and strategies. We may have taken one or two courses; I believe they should have taught us more than that. [FG4]

Insufficient Field Training. The other important issue mentioned by teachers related to pre-service training. Universities in Saudi Arabia designate the final semester of university study for field training. Usually, special education departments coordinate with schools located in the same city to allow teachers to participate in teaching duties at those schools for one semester. Student-teachers are often supervised by university faculty and classroom teachers. Participants reported that they were randomly allocated to schools and were not given any choice in the type of special education programme they were assigned to. Many teachers stated that they did not get a chance to meet even one student with autism during their university training.

Additionally, many teachers complain about the short duration of the field training:

> The field training extends only for one semester, and the supervisor visits are limited as well; they visit us no more than once or twice. [FG3]

> I regretted the years I wasted to get my degree; the university did not prepare me in the right way to deal with a student with autism. [FG1]

6.2.3.2 Theme 2: Failure to Thrive in an Ill-equipped Classroom

Participants commented that the ability of students to thrive in the classroom is contingent on the availability of appropriate equipment and teaching materials. They explained how inadequately equipped classrooms hindered their ability to adopt and effectively implement EBPs.

Definition. This theme captures teachers' concern about the lack of proper equipment in the classroom and its impact on their ability to utilise EBPs with students on the spectrum. They identified access to essential tools, technologies, and teaching aids (e.g., communication devices, smart board, visual schedules, adaptive furniture) as a prerequisite to the adoption of EBPs in the classroom.

Central Organising Idea. In Saudi Arabia, students with diverse learning needs are offered free education, and the Ministry of Education provides schools with the necessary facilities, educational equipment and teaching aids. Students with special needs who attend private schools receive compensation for tuition fees. However, the government does not supply private schools with any educational resources or teaching equipment. Teachers in both public and private schools reported that a lack of access to educational aids and resources hindered their ability to utilise EBPs:

> Not even 3% of the special education equipment is available here. For private companies that we work with, the focus is profitability, and therefore, they do not provide the necessary tools and technology to support the use of EBPs. [FG1]

> Some equipment, such as a projector, is available, but still there is a shortage. Every case we teach requires specific teaching aides that are suitable for the teaching goal. [FG3]

The type of equipment, materials, and tools needed to support EBPs varies. This is because some teaching practices, such as PECS, only require low-tech materials (e.g., cards and pictures) while others, such as augmentative and alternative communication, require relatively expensive devices and software. Teachers across all FGs were aware that many EBPs can be implemented with minimal preparation and only need basic tools. They also

knew that other EBPs require the support of technology and, in certain situations, technical customisation to fit individualised needs: Many of the EBPs, especially those related to utilising augmentative and alternative communication, are not available:

> For example, when I decided to use PECS, I designed and produced it myself. [FG1]

As one participant observed, there is always a need for some type of support to successfully implement any of the EBPs:

> Even when implementing preference assessment, this must be done in a specific way using specific tools. [FG2]

Others pointed to the importance of having learning aids and equipment that are suitable for different levels of need among students with autism, particularly those who require substantial support:

> I can easily teach a student with mild autism, but for some children with severe autism, I need financial support to provide learning aides that fit his needs. [FG1]

Supporting Ideas and Additional Evidence. This idea was underpinned by participants' identification of three specific aspects of classroom setup and equipment that presented barriers to implementing EBPs for students with autism. Each of these is elaborated below.

***Logistics and Legislation*.** Many teachers across multiple FG meetings commented on the inadequate support they received from the official authority in the Ministry of Education. They pointed out that the Ministry provides learning aids randomly, without considering the specific needs of students with autism or teachers' requests:

> Legislation developed by the Ministry of Education must consider classroom equipment to support the adoption of EBPs. [FG3]

In addition, they reported that they received little support from their schools in relation to the provision of learning aids and equipment:

> Support from schools is very, very minimal, and if we request learning aids and tools, we wait for a very long time to obtain these equipment or technologies. [FG4]

In many cases, they reported, they were compelled to purchase teaching materials as learning aids for their students:

> Often, teachers spend money from their pockets; how? How do they receive their money back? They may or may not get compensated based on the available budget for the classrooms. I swear, sometimes your money will not be returned. [FG5]

Physical Environment. Classrooms for students with autism are designed and equipped in the same way as those for students in general education. However, participants argued that classrooms for students with autism should be organised differently to provide a supportive, safe and sensory-friendly environment by, for example, designating areas with specific zones for specific activities. In addition, they highlighted the importance of clear visual boundaries or structure to support self-regulation, limit distractions, and promote one-to-one teaching.

> Students with autism benefit greatly from structured sections in the classroom, but our class does not. Designated areas are not applicable in our situation, and classrooms are not designed for that purpose. We have only

> chairs and tables; no cabinets or other items are available to facilitate the construction of learning zones. [FG4]

Interactive Technologies. Despite the lack of various learning aids and equipment, participants repeatedly emphasised the centrality of technology to effective teaching for most students with autism due to its ability to provide multisensory engagement. According to some teachers, screen-based pictures and videos are valuable for children with autism since they are visual learners and can be more responsive to visual stimuli. For example:

> Smart devices allow students with autism to interact effectively, interact with voices, interact with moves; this is, for me, the number one reason to provide them in the classroom. [FG4]

Participants also pointed to the fact that many EBPs, such as video modelling, music-mediated intervention, and AAC, required various types of technology, from basic to advanced. As such, limited access to such technology constituted a barrier to implementing EBPs in these Saudi classrooms:

> Of course, one of the most important things that should be provided in the classroom is the interactive whiteboard […] I present the learning activity or a question; the child, by touch, for example, chooses the answer, colours the answer, or points to the answer. Interactive whiteboards are essential, indeed. [FG5]

6.2.3.3 Theme 3: Insufficient EBP Knowledge

Teachers identified a lack of knowledge about EBPs as another important barrier to implementation. This did not necessarily mean that they were unaware of the existence of specific interventions. Rather, they lacked the knowledge needed to effectively implement

EBP protocols or to select the particular teaching practice appropriate for the target skill or a student's age and current performance.

Definition. This theme suggests that insufficient knowledge about EBPs or how to use them in practice represents one of the primary obstacles to implementation. It also includes teachers' use of unsupported or inappropriate teaching practices.

Central Organising Idea. Many teachers openly acknowledged that they lacked the necessary knowledge and skills to implement EBPs. They identified a number of reasons for this, which varied according to individuals' circumstances. As a recently-hired teacher commented:

> Some of us have no experience at all. This is the first year for us teaching students with autism, and we have never been in training for EBPs. [FG1]

Yet, another teacher with over ten years' experience expressed a similar lack of preparation:

> I mean, frankly, we are not very well informed about what EBPs are […] Maybe I am using interventions that are evidence-based and successful, or maybe they are interventions [...] that do not work with students with autism. [FG4]

Participants also reported finding it difficult to select suitable EBPs for particular target skills. A commonly cited example was not knowing how to deal with off-task and disturbing behaviours:

> We desperately need information about how to deal with behavioural problems; autism is a world in itself; we do not even know why a child behaves in a particular way. [FG4]

> If a child with autism shows some repetitive and stereotyped behaviours or, for example, gets irritated by a loud voice and starts screaming, it is important for me to have knowledge and expertise about related behavioural interventions. [FG4]

Difficulties in teaching nonverbal students were also mentioned several times, with participants expressing their frustration at the limited progress they were able to achieve with such students and commenting on how parents' high expectations placed extra strain on them:

> We face problems when teaching a nonverbal student. Some students do not have the ability to speak. What should we do with nonverbal students? We need to know the appropriate teaching practice or strategy to use. [FG4]

Supporting Ideas and Additional Evidence. Teachers described particular gaps in their understanding of EBP, such as the complex steps involved, as a barrier to implementation. Other barriers included the use of unsupported and possibly harmful interventions by other teachers and families, and the difficulties involved in locating trusted and credible information.

Lack of Procedural Knowledge. When implementing any EBP, systematic steps must always be followed to ensure a successful outcome. Many teachers reported that they found it difficult to understand some of the complexity of this multi-step procedure; as a result, they avoided implementing it. One teacher commented that, during his many years of experience, he had observed several teachers using EBPs incorrectly because they were unaware of the steps involved. As an example, he referred to the use of PECS to enhance communication skills:

> Teachers use images, and they are mistaken in thinking that whenever they use an image, they are applying PECS [...] PECS has a specific protocol, six steps that they must follow. [FG2]

During the discussions, it became apparent to the researcher that, although participants reported using reinforcement to encourage desired behaviours, they were unaware of the different types of reinforcement schedules or the importance of preference assessment in determining the most appropriate reinforcer.

Families' Use of Unsupported Practices. Teachers indicated that students' performance and motivation in the classroom were adversely affected by their family's lack of knowledge about the condition, and their use of unsupported practices at home. Participants commented, for example, that some parents believed autism to be curable, and adopted a variety of unsupported practices, such as strict diets, herbal remedies, oxygen therapy, camel urine and milk, and physical and verbal punishment. Teachers remarked that such practices had a negative effect on students' behaviour during the school day. For example:

> Some families impose a certain diet on their children, which causes poor responsiveness and decreased energy in the classroom. Because of this diet, the student displayed undesired behaviours, such as hitting his classmates and stealing food.

In other words, the actions of families indirectly acted as a barrier to the teacher's ability to effectively implement EBPs.

Unreliable Sources for EBPs. None of the participating teachers reported that they had consulted trusted sources for EBPs, such as peer-reviewed articles or guidelines

published by governmental organisations. Instead, they relied on experiential knowledge and personal judgment:

> I have acquired experience, I know how I deal with my students, I have developed myself through interacting with students, I do not believe that what we have studied benefited me. [FG3]

> If a student exhibits undesirable behaviour or has an academic problem, I can test one approach, then another until I find an effective solution; it does not have to be based on scientific evidence. [FG5]

Others commented that parents or peers can be a good source of ideas for teaching practices. However, when the researcher prompted further discussion of what they had learned from parents and peers, it emerged that most of the suggested practices were either unethical or scientifically unsound. For example, one teacher explained the strategy that she used to calm a student following the mother's advice:

> I let her face the wall, [...] The mother said I have to do this with her; the only way to calm her down is by letting her face the wall and talk to her in a particular tone. [FG4]

Many participants reported that they had used Twitter and Instagram to search for information about appropriate teaching practices for students with autism. Some teachers completely trusted the information disseminated through these platforms:

> To be honest, I personally benefited greatly from social media. I always come across new information about autism. I mean, I feel that social media platforms are beneficial in this regard. And sometimes Instagram. I personally follow several accounts. For example, mothers of children with

> autism share their experiences using play therapy and sensory integration therapy. [FG4]

Others were somewhat more sceptical:

> It is true what my colleague said. There are many individuals specialising in the autism field, and I have seen numerous really good accounts. However, the problem is that you do not certainly know who is absolutely expert or if the information provided is accurate. [FG4]

6.2.3.4 Theme 4: Administrative and Structural Obstacles

As previously explained, the acquisition of knowledge about EBPs is necessary but insufficient for successful implementation. Participants reported that some EBPs are feasible, adaptable, and easy to implement in autism classrooms. However, they indicated that they often encountered barriers to implementation. These barriers were of two main kinds: official policies that fail to align with the principles of EBP and the needs of students with autism; and the heterogeneity of the autism population, which poses challenges for teachers, particularly in relation to dealing with different cognitive levels and communication styles.

Definition. This theme captures the barriers to action. Teachers indicated that, although they may have been familiar with various EBPs and were willing to use them in the classroom, they were restricted by a combination of internal and external factors, namely, administrative and structural obstacles, and the practical and emotional challenges of dealing with varying manifestations and degrees of severity associated with autism.

Central Organising Idea. While this theme covers a broad scope, the central organising idea is barriers to action. Many examples of administrative or structural barriers to implementing EBPs were discussed during the FGs. It is important to note that this theme does not focus on the lack of support by policymakers and administrators but, rather, on how

existing policies and legislation hinder the implementation of EBPs in autism classrooms. Participants prefaced their comments by pointing out that they had not been given the opportunity to contribute to decision making in relation to legislation governing school policies and curriculum planning, nor were they officially entitled to do so. Instead, many of those involved in creating these policies in the Ministry of Education were non-specialists.

For example, school administrators tended to assign students with different levels of severity to each classroom to achieve a balanced workload for teachers. Ironically, teachers reported that this heterogeneity exacerbated the problem and made one-on-one teaching impossible. As they explained, having two students with similar educational goals allowed them to work with two or perhaps three students simultaneously, shifting their attention between them. In addition, tailoring activities and selecting the most effective EBP for a particular student requires understanding his or her strengths and needs. In this context, the participants in FG1 commented that the school administration did not provide a diagnostic report for each student, including information about medical treatment, which would allow for the selection of individualised interventions. As one teacher explained:

> A good diagnosis and report of the severity can help the teacher choose the right intervention or teaching practice. [FG1]

The individualised education plan (IEP) is the foundation for translating the EBP into actionable steps. Yet, participants reported, many regulations issued by the Ministry of Education hinder the implementation of the IEP. While the educational objectives identified in the IEP are based on the current level of student performance, the Ministry of Education establishes academic objectives based on age or educational level. Teachers repeatedly identified predetermined educational goals as barriers to both IEP and the implementation of

EBPs. Many remarked that this policy fails to align with the nature and homogeneity of students with autism:

> [Best practice] is to follow an IEP for each student, and each student has distinct goals and educational practices that are appropriate for him and unique from other children. [FG1]

> The Ministry of Education imposed the use of unified educational goals for all students within the same educational stage. For example, it is required to teach these educational goals to students, even though they do not suit their level, or they have achieved them before. However, we are obliged to follow the system. [FG6]

On a related issue, teachers observed that autism classes were structured in the same way as those in the general education system, the school day being divided into seven lessons, each lasting 45 minutes. They commented on the inappropriateness of this structure for students with autism:

> A child with autism does not need 40 or 45 minutes, and allocating this time is beyond their ability. Of course, teaching must be individualised. Each session, the child has only 10 continuous minutes. [FG5]

Another teacher explained that students become bored by a daily schedule that focuses on academic material:

> Placing students all day in the classroom is very challenging; there is no variety and no entertainment. [FG6]

Supporting Ideas and Additional Evidence. Various other barriers to action were discussed during the FGs These were classified into teacher-related factors and student-related factors. The former mainly involved teachers' mental and emotional state, and how factors such as stress, self-doubt and burnout hindered their ability to implement EBPs. The latter were linked to the severity and heterogeneity of students' cognitive and behavioural characteristics.

Teachers' Emotional State. When teachers experience any type of psychological challenge, their ability to adopt or implement EBPs is likely to be negatively impacted. During the FG meetings, the researcher interpreted many of the participants' statements as latent signs of tension and anxiety in their dealings with students with autism. For example, fear of failure was commonly identified as an obstacle to adopting or implementing EBPs:

> We fear that a strategy or teaching practice will not work well. I mean, this is why we have some anxiety. As I said, this is the problem we face; we are afraid that after spending a long time implementing it, the child or the student will not benefit from it. [FG4]

Teachers also discussed how many parents set unrealistically high educational goals for their children without considering the amount of time and effort required to achieve gradual progress. In a dialogue with teachers in the first focus group, he explained his anxiety when meeting parents of non-speaking children who always complain about their child not speaking. Some teachers also mentioned many other reasons for their negative emotional state, including the three-semester system, inactive classroom teaching, and administrative staff interference.

Characteristics of Students with Autism. Understanding and accommodating the core diagnostic characteristics of autism is essential when teaching students with autism. Teachers

were aware that the uniqueness of autism traits, such as communication difficulties, emotional regulation issues, or sensory differences, all affect the level of engagement and intervention response. They identified particular issues that hindered the implementation of EBPs in the classroom. Of these, heterogeneity in language and cognitive development was a primary challenge for many:

> The first thing that hinders me, personally, is the differences among the students because each one has different individual characteristics […] The number of students in the classroom may not be a problem, but the issue is their level discrepancies. [FG4]

Others spoke about the frustration they experienced as a result of the misalignment between official expectations and what some students can actually achieve; for instance, those requiring a significant level of support struggle to learn academic skills, whereas a more realistic goal is to teach them daily living skills:

> The Ministry of Education pressures the school to accept students with severe autism who are not able to learn academic skills. However, we are required to teach them academic skills. [FG2]

Other student-related characteristics that impeded teachers' ability to effectively utilise EBPs included short attention span, limited engagement and attachment to routine.

6.2.4 Facilitators Identified in Response to the Second Qualitative Research Question

The second question sought to elicit teachers' suggestions for enhancing the adoption and implementation of EBPs in the Saudi context. Table 6.4: The themes that emerged from analysis of the qualitative data to answer the second question.

Table 6.4

Themes Developed for the Second Qualitative Research Question

Research Question	Developed Themes
What strategies do teachers of students with autism in Saudi Arabia recommend for supporting the implementation of EBPs?	1. Customising EBP training 2. Building teams and enhancing collaboration 3. Making EBP contextually relevant

6.2.4.1 Theme 1: Customising EBP training

This and subsequent themes focus on participants' suggested solutions to the problems identified in the findings for Research Question 1. A solution-focused approach is necessary to drive opportunities to enhance the adaptability of EBPs and support sustainable implementation outcomes.

Definition. Teachers suggested the development of tailored EBP training as a key solution to the barriers hindering the adoption and implementation of EBPs. This theme emphasises the significant role of teachers in determining training needs, mode of delivery, and style of mentor training, as well as the characteristics of trainers. It is important to note that this theme only relates to on-the-job training, and does not include self-learning or pre-service teacher training.

Central Organising Idea. Reflecting the challenges associated with limited knowledge of EBPs and poor university preparation, teachers identified the need for specifically designed EBPs training to address their unique needs. This theme accounted for the largest number of developed codes compared to all other themes.

Teachers expressed the view that the current training opportunities provided by the Ministry of Education in Saudi Arabia did not align with their priorities and expectations.

Many commented that training authorities in the Ministry had, perhaps unintentionally, neglected training in EBPs and autism:

> There is not enough training in our area of expertise […]. For example, when the Ministry of Education publishes their yearly training courses, we find that only one, two, or three training courses are about special education. [FG4]

Others expressed frustration that even these special education training courses focus on other groups with special needs rather than students with autism:

> This year, from the beginning until now, I have not had a chance to be in any training courses that focus on special education or autism and EBPs. [FG2]

Although participants could not agree about the reasons behind the lack of specialised training courses, a frequently voiced opinion was that poor communication channels with authorities in the Ministry of Education and the hierarchical structure of administration could account for the failure to determine teachers' training needs.

Participants in all FGs expressed their willingness to attend EBPs training:

> Teaching becomes routine, so we need, I mean, the field constantly evolving, so we need someone to inform us about the latest updates and the most current research and useful teaching practices. [FG5]

Many early career educators were particularly responsive to mentorship and training opportunities. At the same time, they emphasised that any such courses needed to be designed to address their specific needs and daily challenges:

> At the beginning, they must identify our needs, what topic we are interested in, and based on that, they hold training courses for us. [FG5]

Finally, as discussed earlier, fear, anxiety and other negative emotional states were identified as barriers to adopting or implementing EBPs. Some participants felt that customised training could help to alleviate these concerns:

> Receiving good training to use the teaching practices may help me feel less anxious and more motivated to use EBPs; also, when my colleagues share their successful outcomes with me, I think this may motivate me because there is a successful example. [FG1]

Supporting Ideas and Additional Evidence. Teachers expressed their views about the form these courses should take in relation to content, delivery mode and trainer characteristics. Each of these is elaborated below.

Content of Training Courses. Although participants suggested a variety of training topics based on their individual needs, they identified the practices associated with Applied Behaviour Analysis (ABA) as a priority. They agreed that training content must include teaching practices backed by strong research evidence and demonstrated effectiveness for students with autism:

> ABA is an excellent approach for children with autism; it has completely transformed how children can be taught. [FG6]

ABA teaching practices can be employed to increase desired behaviours and decrease undesired behaviours. Almost all participating teachers expressed their willingness to receive training in ABA teaching practices to deal with off-task behaviour and manage the classroom effectively:

> There is no question that behavioural treatments are the most effective. […] If a child exhibits certain behaviours or repetitive movements, or if, for instance, he is disturbed by noises or enters into a screaming fit or something like that. Then, of course, I mean, there should be behavioural training for me and to have experience in the subject of behavioural therapy. [FG4]

Some teachers noted that they were currently relying on training courses and certification in ABA provided by foreign countries because no comparable programs were available locally. In fact, many training courses in ABA are conducted in Saudi Arabia, mainly provided by English speakers. However, barriers exist in relation to language, cultural relevance and cost:

> The Ministry of Education in Saudi Arabia do not accept these courses in ABA to be added to my portfolio, even though the organisation offering them is certified, an entity whose reliability is taken for granted. [FG2]

Dealing with behavioural challenges was mentioned as a top priority for training. Next in importance was dealing with students with severe autism and non-verbal students. Teachers described the difficulties they faced in achieving concrete outcomes with such students:

> Our school is obligated by law to accept extremely severe autism cases that are incapable of learning […]. However, the teacher is held accountable for teaching them the curriculum for those capable of academic learning. [FG2]

After observing that most students in private schools are those with moderate and severe autism symptoms, one participant commented:

> Most training courses do not focus on EBPs that are appropriate for severe and moderate autism cases, despite our need for them. [FG1]

These findings highlight the importance of working in partnership with teachers to tailor the content to meet their needs.

Training Delivery Methods. Participants discussed various formats for the delivery of EBP training, many proposing that mode of delivery was of equal importance with content. Traditional and online lectures where the trainers speak and the end users (teachers) passively listen were not viewed as ideal for enhancing the practical application of EBPs:

> We attended many online courses, and the number of teachers exceeded 100, for example. Yes, the trainee is just a listener; we could not actively engage and express our opinion. [FG6]

A frequent suggestion was to use interactive workshops and problem-based learning to allow a small number of participants to better engage with trainers, materials and other participants:

> Consulting with an expert to find solutions linked to using evidence-based practices [...], working on a one-to-one is better than a lecturing method, and workshops in which there is discussion, not lecturing. [FG1]

Other recommendations included allowing trainers to attend the classroom and provide direct feedback, and peer coaching, also known as mutual classroom visits. The latter approach was particularly mentioned by female teachers. In this delivery method, the visiting teacher demonstrates the selection and implementation of a particular EBP in the classroom, while the host teacher observes, reflects and asks questions later:

> Many training courses are now taught by a trained teacher [...], and some teachers attend the training course and return and spread their experience. This is available to us as teachers to provide training. This even enhances job performance. [FG6]

Partnership Development and Characteristics of Trainers. Universities and other educational institutions play a crucial role in providing EBPs training for teachers working with students with autism. The participants in this study trusted that local universities possessed the relevant academic expertise and knowledge of research developments:

> We want to be informed about the most recent research in autism and EBPs. Universities and institutions could keep us informed with the latest studies. Not everyone can access the latest studies. [FG1]

However, participants were generally dissatisfied with the Ministry of Education's partnerships with other universities and institutes. The teachers in FG3 suggested that universities establish autism research centres and work in collaboration with schools to examine the efficacy of teaching practices in the Saudi context.

Another strand of this discussion related to the characteristics and competence of the trainer, since these are central to the quality and success of any training effort:

> In order to support a child with autism, we need a specialised trainer in the field, specialised in the field, underline it a hundred times, especially in the field of behaviour analysis. [FG4]

In addition to having the requisite curriculum knowledge and expertise, trainers also needed to have good communication skills and be familiar with the local context:

> Prefer specialised trainers, and in addition to being a specialist in the autism field, they must be familiar with the Ministry of Education legislation and have an idea about the number of students in the classroom, teachers' roles and the school system. [FG5]

6.2.4.2 Theme 2: Building Teams and Enhancing Collaboration

This theme was developed to reflect the importance participants attached to collaborative effort in the adoption and implementation of EBPs in teaching students with autism. Teachers emphasised that they worked in isolation from the students' families, and that specialist support services were unavailable in their schools. This theme includes a section on the types of support that could potentially be provided by different stakeholders.

Definition. This theme emphasises that successful selection and implementation of EBPs requires contributions and support from a variety of individuals. This involves the collaborative efforts of a supportive team, a family, and teaching assistants.

Central Organising Idea. Although the teacher is considered the most important person in the teaching process, collaboration with others, such as parents, students with autism, administrative staff, support specialists and colleagues, is crucial to enhance the overall effectiveness of teaching and learning. Participants discussed the importance of having an Individualised Education Program (IEP) team to identify students' strengths and needs, as this forms a basis for the selection of appropriate EBPs:

> There is no team, only an academic teacher. I mean, we need a team that includes a psychologist, a sensory integration specialist, and a speech therapist. Their unavailability is an obstacle. Of course, unfortunately, most of our schools do not have an integrated team to support using EBPs. [FG4]

Some teachers also argued that, when supportive services are provided, for example, a psychologist or a speech therapist, the learned skills have a better chance of being generalised as students learn in different environments with different instructors. A participant from FG5 explained that team support can reduce the teacher's workload, allow them to dedicate more time to the rest of the students, and facilitate the utilisation of EBPs in one-to-one teaching.

One of the main obstacles to EBP use mentioned by teachers was the large number of students in the classroom. The Ministry of Education assigns a minimum of five students per teacher. However, many teachers argued that one-on-one teaching is essential for the successful implementation of EBPs for students with autism, and the absence of assistant teachers makes this difficult to achieve. One proposed solution was that the Ministry of Education provide an assistant teacher who remains in one classroom or rotates between classrooms:

> There is a large number of students, and at the same time, we are required to conduct one-to-one teaching [...] Even if we have less than five students in the classroom, I cannot work with a single student without assistance. [FG1]

Various other suggestions were made in relation to the role of assistant teachers. These included freeing the teacher from disciplinary activities or providing limited support in the implementation of an EBP:

> The assistant teacher can maintain the classroom discipline while the classroom teacher implements EBPs. [FG5]

> The PECS protocol for Andy Bondy requires an assistant teacher. You may wish to implement alone, but the authors indicated it must be an assistant teacher. [FG2]

Supporting Ideas and Additional Evidence. While assistant teachers can provide direct support to classroom teachers, administrative staff and families can provide other important forms of support and access to resources. This section focuses on each of these in turn.

Administrative Staff. Participants expressed dissatisfaction with the kind of support they received from administrative staff, arguing that they do not understand what teachers need to support the implementation of EBPs for students with autism:

> Administrators are not specialised in autism teachings and have not even earned a degree in special education. I think they have a poor academic background, and when they choose to work in administration, they basically run from teaching duties. [FG2]

> I am telling you that the culture and the positive attitude of school administration, especially in autism educational programs, are so important for successfully applying EBPs. [FG2]

To address this problem, they recommended that the Ministry of Education should do more to ensure that administrators were knowledgeable about autism, and that administrators should engage in direct dialogue with teachers to identify EBP facilitators and establish mutual expectations.

Family support. Participants emphasised the vital role played by families in supporting the development of their children's academic, social and behavioural skills. In particular, they highlighted the importance of consistency between school interventions and the teaching practices adopted at home for maintaining and generalising acquired skills. However, they reported that most families were insufficiently engaged with the school and offered only limited, if any, appropriate support:

> Students will not develop further […] if there is no interest in collaborating with them at home and they are abandoned by the parents. I will not see noticeable development; it will be weak development, or there will be no development. [FG4]

Some teachers commented that they became more motivated to implement EBPs with their students when parents actively participated in their child's education and continued to work with their child at home. Overall, they recommended that parents should be involved in EBPs training, that clear communication channels with families should be established, and that schools should hold regular meetings for families to attend.

6.2.4.3 Theme 3: Making EBP Contextually Relevant

This theme highlights the importance of adapting EBPs to the context of Saudi Arabian norms, values and beliefs. Although they acknowledged that some EBPs were suitable for implementation across different cultures and educational systems, they emphasised that their effectiveness and sustainability are considerably enhanced when practices are grounded in the local environment. They made several recommendations for making EBPs more suitable for the Saudi context, as discussed further below.

Definition. This theme was developed to emphasise the importance of ensuring that EBPs are aligned with the Saudi Arabian educational and cultural context. Teachers emphasised the need for robust evidence from local research to inform adaptations. For this purpose, they recommended that teachers be enabled to participate in regional research and that access to Arabic information resources be improved.

Central Organising Idea. This theme captures the commonly expressed idea that contextual fit is important for maximising students' learning outcomes. Participants reported that not all EBPs were suitable for implementation in the Saudi context without careful

adaptation. They acknowledged that some ABA teaching practices, such as extinction, are not culture-specific and do not require local modification.

A significant consideration here is the fact that Saudi Arabia is one of the most conservative countries in the Arab world, and adherence to Islamic teachings is a salient aspect of people's lives.

> Indeed, we need to adapt teaching practices to our culture, customs and traditions. Of course, Islam is life for us. Yes, it is the mirror through which we see life. So, when something comes up that we disagree with, we need to adjust it. [FG2]

Specific EBPs were identified as potentially inappropriate for the Saudi context and requiring some modification. For example, the use of music as an intervention is controversial because many Muslims believe that the Quran and Sunnah prohibit music. While some teachers disagreed with this view, both agreed that the school administration and some parents may object to the use of music-mediated interventions on religious grounds. Therefore, many suggested that music be replaced with vocal Islamic chants or sounds of nature.

Another potentially inappropriate EBP in the Saudi context was the use of social narrative or video modelling to teach social skills:

> Cartoon scenes and narratives are not appropriate for our society and are not compatible with the Islamic religion. [FG1]

> We must create stories aligned with our local culture. [FG3]

In summary, participants agreed that some teaching practices, such as extinction, reinforcement and prompting, are appropriate for the local context because they primarily

operate through environmental modification and the shaping of behavioural responses. However, content-dependent teaching practices, such as social narratives, scripts and video modelling, need to be modified to reflect local cultural expectations.

Supporting Ideas and Additional Evidence. Participants indicated that key stakeholders, such as the Ministry of Education and local universities, should direct more effort toward making EBPs contextually relevant. This should include conducting more research in Saudi Arabia focused on enhancing the applicability of EBPs to local educational settings for students with autism. Supporting teachers to participate in relevant research initiatives was also suggested.

English to Arabic Translation. Knowledge about EBPs is predominantly generated from Western scientific research and published in English. This creates a barrier for non-English speakers to accessing the most recent research evidence. In this context, several teachers commented that they had insufficient or no knowledge of English, since Arabic is the medium of instruction in all Saudi education colleges:

> Arabic is our language for work and study […] Honestly, they should provide a translation service before asking us to implement and use EBPs resources. However, it is given like this in English, and when a teacher says, "I cannot translate," they say, "No, you translate it, and you manage it yourself." I think that is a mistake. [FG5]

Optimising EBP Use Through Local Research. Participants expressed the view that the value of EBP-related knowledge is enhanced when it is based on research that is conducted in the locality in which it will be translated into practice. They commented on the lack of relevant educational research on autism, and agreed that solutions based on local data would enhance their performance:

> Saudi Arabia is far behind in terms of autism research. Therefore, we do not receive research updates in time, […] so we need research in our environment that proves EBP effectiveness. [FG1]

Others were critical of the failure of local universities to conduct research on autism education, contrasting the Saudi academic environment with that in other countries:

> Countries that have advanced research, I mean to a large extent, countries such as the US and Britain, and I expect Australia, are much more advanced than us in teaching students with autism. [FG4]

Ensuring the relevance of EBPs to the Saudi school context involved considerations other than the need to avoid conflict with traditional norms and values. In particular, there is an expectation in the Saudi cultural and educational context that students acquire knowledge related to Islamic faith and worship practices. While there is substantial evidence supporting the use of EBPs to teach various academic and behavioural skills to students with autism, there is a gap in relation to these objectives. For example:

> Some parents request that their children memorise verses from the Quran and learn and be educated in religion. This is one of the things that parents ask, I mean, a lot. [FG2]

> When the girl is older than nine years, for example, her parents want her to learn how to wear an abaya or a headscarf. [FG6]

Overall, participants were strongly of the view that local research evidence was needed to facilitate the use of EBPs in the Saudi context, especially when addressing learning objectives that are unique to the Saudi educational system.

Chapter 7: Discussion and Conclusion

This chapter summarises and discusses the study's key findings in relation to the literature and the research questions. The aim and methods of the two components (quantitative and qualitative) are briefly reviewed, and the results are interpreted. The chapter concludes by considering the implications of the findings and the limitations of the study, and makes recommendations for future research and practice development in the area of autism education.

7.1 Overview of Methods and Results

7.1.1 Quantitative Component

The KTA framework (Graham et al., 2006) was used to collect quantitative and qualitative data from teachers of students with autism in Saudi Arabia. In the quantitative component, a self-report rating scale was employed to measure participants' knowledge and use of 40 teaching practices across three categories. The survey was disseminated online, using a Qualtrics-generated link and barcode, to schools that provided educational services for students with autism. The final sample comprised teachers (N=106) from diverse regions in Saudi Arabia. In the qualitative component, focus group discussions were employed to collect data on barriers to, and facilitators of the implementation of EBPs in the local context. Teachers (N=42) participated in two consecutive focus group meetings (12 meetings in total), which were conducted at six public and private schools in Saudi Arabia.

The first research question was: How do teachers of students with autism in Saudi Arabia rate their knowledge and use of evidence-based, emerging, and unsupported practices?

Descriptive analysis of the knowledge and use scales revealed that EBPs were ranked noticeably higher than most of the EM and UN teaching practices, indicating lower levels of familiarity and use among teachers. However, some non-evidence-based practices, such as

Punishment (EM), Rapid Prompting Method (UN) and Facilitated Communication (UN), appeared among the highest rated items in both scales. Comparative analysis revealed a statistically significant difference between the mean scores of all teaching practice categories within each scale. The mean scores for the use of EBPs and UNs showed the most significant differences, followed by those for knowledge of the same teaching practice categories. In relation to other teaching practice categories, some differences were statistically significant, but these were small in magnitude.

The associated research sub-question was: How do demographic factors such as gender, employment sectors, and years of experience relate to the reported knowledge and use of evidence-based, EM, and UN practices? Two analytical approaches were adopted: comparison across individual teaching practices and comparison of the average means of teaching categories.

The results indicated no statistically significant gender differences in knowledge or use. In relation to the employment sector, there was a statistically significant difference in the use of EM practices between public and private school teachers. Comparative analysis of individual teaching practices (knowledge and use, 80 comparisons in total) across the demographic subgroups revealed statistically significant differences in relation to only three of the 40 teaching practices by gender, five by employment sector, and 13 by years of experience.

7.1.2 Qualitative Component

Qualitative data were collected to obtain insights into teachers' perspectives on barriers and facilitators. Reflexive thematic analysis (TA) (Braun & Clarke, 2022) was employed to answer the second and third research questions: What do teachers of students with ASD in Saudi Arabia report as the key contextual barriers that inhibit the

implementation of EBPs? and What adaptations do teachers of students with ASD in Saudi Arabia recommend to facilitate the implementation of EBPs?

The analysis generated four dominant themes. “The University Failed to Prepare Me” identified inadequate pre-service training as one of the main barriers to the implementation of EBPS. “Failure to Thrive in an Ill-equipped Classroom” captured participants’ concerns about the impact on students’ learning outcomes of the lack of appropriate teaching equipment, including interactive technologies, and of other resources such as teaching assistants, and poorly designed classrooms. “Insufficient EBP Knowledge” reflected teachers’ acknowledgement of their limited familiarity with EBPs. “Administrative and Structural Obstacles” captured the impact of administrative and structural challenges on their ability to implement EBPs in the classroom, particularly in relation to policies on the allocation of students with different levels of symptom severity.

Three other themes were developed for the third research question, namely, what teachers identified as potential strategies to address these barriers. “Customising EBP Training” highlighted the need for the development of specialised training that would be designed to address their unique needs and which should include their input into content, trainer characteristics and mode of delivery. “Building Teams and Enhancing Collaboration” emphasised teachers’ desire to work in collaboration with parents and other stakeholders to achieve effective implementation of EBPs in the classroom; in this context, they recommended the employment of teaching assistants to help maintain discipline, especially when new or multi-step EBPs were being implemented. “Making EBP Contextually Relevant” captured the importance of ensuring that EBPs aligned with the Saudi Arabian educational system, local values and Islamic beliefs. They made the ambitious recommendation for the Ministry of Education and universities to optimise EBP

implementation by conducting local research and improving access to relevant literature by, for instance, making available Arabic translations.

7.2 Beyond Interpretation: Pushing the Field Forward

This section discusses the findings from the quantitative and qualitative components of the study in relation to each other. In mixed-methods research, it is not always possible nor desirable to force the integration of data; rather, examining data in parallel sometimes provides a better understanding, and integration is only recommended when it provides deeper insight into the topic (Creswell & Clark, 2017). Accordingly, the focus of this section is on how the qualitative data explain, expand or differ from the quantitative results, and on how the findings from both approaches relate to the literature to identify key patterns, alignments or discrepancies.

Overall, an integrated analysis of quantitative and qualitative data suggests that the research problem should be reframed as a lack of alignment between EBPs and the Saudi teaching context. That is, a problem of contextual fit rather than merely a lack of knowledge among teachers of students with autism. In the IS framework, contextual fit is defined as the extent to which an intervention's core components match the values, needs and settings of the targeted end users (Horner et al., 2014). Therefore, aiming for contextual fit means shifting from asking whether teachers have sufficient knowledge of EBPs and are well-trained to exploring educational system determinants that support EBPs' implementation. As the data presented in this thesis show, in hierarchical, high power-distance educational communities like Saudi Arabia (Hofstede, 2011), the contextual integration of EBPs requires action through a formal national process rather than individual teachers. Educational authorities, therefore, must ensure that EBPs fit the sociocultural, linguistic, religious, and organisational realities of Saudi practice settings.

The qualitative data, in particular, highlight the lack of a professional training model in Saudi Arabia and suggest that even occasional workshops do not focus on EBPs. This finding aligns with the literature, which indicates that traditional and one-time coaching are inadequate because they contradict the IS principles underpinning knowledge translation processes (Almutlaq, 2021; Bertram et al., 2015). Here, too, contextual fit emerges as a crucial factor in the development of professional training for teachers of students with autism in Saudi Arabia. The findings of the present study strongly support the need for generalised training to be supplemented with site-specific, customised educational programs designed to meet pre-determined needs. In other words, achieving a sustainable EBPs training program requires adopting a system-wide lens on professional development (Luskin-Saxby & Paynter, 2018). Such a program should include ongoing training designed not only to enhance teachers' knowledge but also to ensure treatment fidelity through multi-level coaching, peer support, and supervised feedback. This will require educational authorities in Saudi Arabia to shift their role from knowledge disseminator to developer of local training programs and communities of practice, utilising available models, such as train-the-trainer.

The study identified several other challenges to the implementation of EBPs, including the lack of local supervisors and qualified professionals, inadequate pre-service programs, insufficient assessment tools, a paucity of Arabic-language resources, and the absence of supporting policies and guidelines. All of these deficiencies reflect the limited availability of local research infrastructure and expertise. Local researchers are key drivers of sustainable progress if they are empowered to do so. Unfortunately, governments and organisations in Arab countries do not give priority to local research and do not allocate enough funding for research on mental health and related fields, including autism (Hassan, 2019; Jaalouk et al., 2012). According to Sulaimani and Gut (2019), this lack of local research has a negative impact on the quality of services for individuals with autism in Saudi

Arabia. The qualitative data from the present study align with the broader call for educational authorities in Saudi Arabia to allocate more funding to build expertise and facilitate the creation of local research opportunities (Kelly et al., 2024). This has the potential to build internal research capacity and develop local researchers who are culturally aware and who are qualified to provide evidence-based advice to inform the development of contextually-relevant EBPs for autism education and overcome local barriers to their implementation.

In hierarchical communities such as Saudi Arabia, the task of bridging the knowledge-to-action gap in relation to the adoption and implementation of EBPs must be elevated to the macro-state level. Teachers in the focus groups clearly located the responsibility for facilitation at the government level. This is because, in high power distance contexts, authority and decision-making reside within the government, including its organisations and ministries (Hofstede, 2011). A specific recommendation for overcoming the challenges to EBPs implementation documented in this study is to align potential facilitators with the goals of Saudi Vision 2030. This is consistent with calls by other researchers (e.g., Allmnakrah & Evers, 2020) to promote the adoption of EBPs as a mechanism to create national-level structures for enhancing autism services. In this way, the success of the Vision and its program of economic reform can be linked to investment in human capital through the development of EBP expertise and improved student outcomes. Additionally, it can be argued that the Vision's goal of building a globally competitive workforce cannot be achieved if ineffective teaching methods continue to be utilised in Saudi educational settings. In addition to the required top-down strategic investment, the Ministry of Education in Saudi Arabia should accelerate the EBPs reform process by establishing a national digital infrastructure. Such an initiative has the potential to involve teachers in decision-making, ensure that their voices are heard through national channels, create training

and supervision platforms that fit the Saudi educational context, and overcome barriers at the individual, organisational, and system levels.

7.2.1 Research Question 1: Overall Findings

How do teachers of students with autism in Saudi Arabia rate their knowledge and use of evidence-based (EBP), emerging (EM) and unsupported practices (UN)?

Teachers of students with autism in Saudi Arabia rate their knowledge and use of EBPs higher than their knowledge and use of the other two categories of teaching practices. Their knowledge and use of EM is somewhat lower (the difference is small), while their knowledge and use of UN was rated lowest of all, moderately lower than for EBPs and somewhat lower than EM, again, a small difference. All pairwise differences between average ratings of knowledge and use of the three categories of teaching practices were statistically significant.

This study yielded results that were consistent with those from previous research reporting greater knowledge and use of EBPs compared to other teaching categories (Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015; Sulek et al., 2019). However, although teachers reported being least knowledgeable about UN practices and using them the least, they nonetheless seem to be using them at a higher rate than their counterparts in other countries, including Australia (e.g., Paynter et al., 2017; Paynter & Keen, 2015).

Very few studies have examined teachers' reported knowledge and use of EBPs in Saudi Arabia (Alatifi et al., 2023; Alghamdi, 2021b; Alhossein, 2021). Of these, only Alatifi et al. (2023) compared reported knowledge and use of EBPs and other teaching categories, such as EM and UN. The findings were in close alignment with those from the current study.

Although the Early Intervention Practices Scale (Paynter et al., 2017) includes teaching practices from all three categories, some studies only examined EBPs (e.g.,

Alghamdi, 2021b; Alhossein, 2021). Other studies only examined EBPs and UN and excluded EM practices (e.g., Barry et al., 2021; Barry et al., 2024).

Understanding of all three categories of teaching practices is crucial if research is to inform the development of effective practices and policies. Investigations that include all teaching practice categories, rather than focusing exclusively on EBPs, could be expected to yield more comprehensive information on all types of teaching practices used by teachers of students with autism. The inclusion of both EM and UN in the present study has provided information that may assist future planning. For instance, better understanding the use of UN practices can inform the development of policies to eliminate potentially harmful practices, while previously unavailable data on EM practices enriches the database on their effectiveness.

In this context, the findings of the current study aligned with those from research in other countries that included all three categories (e.g., Paynter et al., 2017; Paynter & Keen, 2015); that is, teachers reported greater knowledge and use of EBP than EM, followed by UN. Studies that did not include EM in their scale still found that knowledge and use of EBPs were significantly higher than for UN (Paynter et al., 2019; Sulek et al., 2019)

In contrast, Alatifi et al. (2023) found that teachers of students with autism reported greater knowledge and use of UN than EM. A possible explanation for this discrepancy is that the authors allocated some teaching practices into the wrong category and did not adhere strictly to the criteria specified by Steinbrenner et al. (2020), which casts some doubt on the validity of the results. For example, sign language was categorised under EP instead of Augmentative and Alternative Communication, an EBP. Similar issues occurred in the categorisation of other teaching practices, such as Theory of Mind Training and Exercise, which may also have led to invalid outcomes from comparative studies. Overall, however, it

is clear that teachers of students with autism continue to implement teaching practices that have insufficient empirical evidence of effectiveness.

7.2.1.1 Individual EBPs

Teachers reported the greatest knowledge and use of these EBPs: Reinforcement, Prompting, Direct Instruction, Modelling, and Extinction. This finding is consistent with previous studies that employed a self-report rating scale to examine the knowledge and use of EBPs by teachers of students with autism. For example, Reinforcement and Prompting were among the most frequently used and known teaching practices in both the current study and previous research (Alatifi et al., 2023; Alghamdi, 2021b; Alhossein, 2021; Barry et al., 2021; Paynter & Keen, 2015; Sulek et al., 2019). Similar ratings to those found here have been reported for Extinction (e.g., Alatifi et al., 2023; Alghamdi, 2021b; Alhossein, 2021; Paynter & Keen, 2015) and Modelling (Alghamdi, 2021b; Alhossein, 2021; Sulek et al., 2019).

The majority of the most frequently reported practices in this study have a long history and are considered fundamental in Applied Behaviour Analysis (ABA). The results from the qualitative component generally support this finding. Focus group participants described ABA teaching practices as the most reliable and frequently used to teach social and academic skills and manage off-task behaviours. This was also reflected in the theme of "Customising EBP training", where teachers identified ABA techniques as the top training priority. These findings are consistent with those from other studies. Almughyiri (2024) reported that, despite administrative challenges and shortage of training opportunities, Saudi teachers continue to employ ABA teaching practices. Other themes developed from the qualitative data resonate with previous research. For instance, Kelly et al. (2024) highlighted that more investment must be directed toward region-specific research and increasing the number of ABA-certified professionals and programs.

In contrast to other findings, teachers in this study reported infrequent use and only moderate knowledge of Functional Behavioural Assessment (FBA), one of the well-established ABA techniques. FBA plays a vital role in determining the cause of disruptive behaviours. While the infrequent use of FBA can be explained by its data-driven decision-making process, Saudi teachers' lack of knowledge about FBA is a serious issue. FBA is essential for designing behavioural plans and selecting appropriate EBP.

Most previous research has reported a minimal to moderate level of knowledge and use of FBA (Alatifi et al., 2023; Barry et al., 2021; Paynter & Keen, 2015; Sulek et al., 2019). In contrast, Alghamdi (2021b) reported extensive of knowledge and frequent (almost daily) use among teachers in Saudi Arabia. This, however, is questionable since FBA is a diagnostic technique conducted periodically rather than a direct intervention. Typically, there is no need to implement it on a daily basis. This highlights the need to treat findings from studies based solely on self-reports with caution.

There were also discrepancies between the current study's findings and those from prior literature in rating some of the other EBPs. According to Barry et al. (2021), for example, teachers of students with autism in Ireland identified Social Narratives as the most frequently used teaching practice. In contrast, the participants in this study rated Social Narratives as one of the least known and rarely used practices. These results are consistent with those of Alhossein (2021), who found that Social Narratives were among the least used EBPs, as rated by teachers of students with autism in Saudi Arabia. The qualitative component of this study also supports this conclusion and offers a potential explanation: in the context of contextually relevant EBPs, teachers pointed out that practices such as Social Narrative generally contain inappropriate content for the local culture and are incompatible with Islamic teachings. This suggests that the difference in findings between the studies in Ireland and Saudi Arabia may be attributable to cultural differences, and that the use of Social

Narrative is likely to remain less frequent in Saudi Arabia compared to European countries. This is particularly relevant to answering the main research question.

In order for a teaching practice to be effectively implemented and sustained, it needs to be endorsed and supported by key stakeholders. While a practice may be effective in research settings regardless of wider support for it, stakeholder support is usually critical for its consistent application. Therefore, if a practice is seen as inappropriate by Saudi teachers, it is not surprising that it will be applied less often or not at all.

An additional difference between the findings of this study and prior literature was in teachers' rating of Response Interruption/Redirection (RIR). Two Australian studies indicated frequent use of RIR among their participants in general education settings (Sulek et al., 2019) and specialised autism centres (Paynter & Keen, 2015). However, teachers in this study reported a moderate level of knowledge and use of RIR, a result that aligns with those from another research in Saudi Arabia (e.g., Alghamdi, 2021b; Alhossein, 2021). RIR is used to reduce off-task behaviour, especially stereotyped, repetitive and self-injurious behaviours (Steinbrenner et al., 2020). When the undesired behaviours are maintained by automatic reinforcement, not by attention or escape, RIR is one of the very few teaching practices that can be implemented. The limited application of RIR in Saudi classrooms may help to explain why teachers still struggle with stereotyped and repetitive behaviours. In the current study, qualitative data indicate that teachers frequently emphasised their need to acquire the necessary knowledge and expertise to deal with these kinds of behaviours, although no participant referred to RIR explicitly or implicitly.

Music Mediated Intervention (MI) was reported as the least frequently used and least understood compared to all other EBPs. For over two decades, music therapy and its related interventions have shown encouraging evidence of support for the education of students with autism (Reichow et al., 2011). The National Professional Development Center (NPDC)

categorises music therapy as a teaching practice with some empirical evidence but not enough to be classified as an EBP prior to the second-generation review (Wong et al., 2014). However, a recent review of autism interventions offered further evidence to support the inclusion of Music-Mediated Intervention as an EBP (Hume et al., 2021; Steinbrenner et al., 2020). Several studies have investigated teachers' level of knowledge and use of Music-Mediated Intervention; however, many earlier studies classified it as an EM, although participants were not informed of its classification (e.g., Paynter et al., 2017; Paynter & Keen, 2015; Sulek et al., 2019).

The literature review identified Alatifi et al. (2023) as the only study in Saudi Arabia to have measured teachers' reported knowledge and use of Music-Mediated Intervention. Contrary to the findings of the current study, their results indicated that teachers in Saudi Arabia have extensive knowledge of, and frequently implement Music-Mediated Intervention in the classroom. Nonetheless, the majority of comparable studies reported findings that parallel those from this study, suggesting that Music-Mediated Intervention is among the least recognised and rarely used teaching practices, regardless of context (Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015; Sulek et al., 2019). The qualitative findings point to possible cultural explanations for Saudi teachers' reluctance to implement Music-Mediated Intervention. Under the theme of " Making EBP Contextually Relevant", they indicated this intervention was controversial, since many believe that it is prohibited by Islamic teachings and/or that it is rejected by school administrators and parents. In other contexts, teachers reported that limited access to technology continues to be a barrier to implementing many technology-dependent teaching practices, including Music-Mediated Intervention.

Teaching practices in autism education underwent several systemic revisions to become EBPs as we recognise them today. Smith et al. (2007) made the first attempt to develop a model that encompasses multiple sequential stages to facilitate the systematic

examination of teaching practices that meet EBP criteria. This was followed by numerous other systematic reviews to identify EBPs specifically for individuals with autism. The cumulative work by organisations and researchers has expanded the number of identified EBPS from a handful to dozens. As explained in Chapter 3, for this study, the Early Intervention Practices Scale (Paynter et al., 2017) was revised to accommodate the most recent review of the literature on autism-specific EBPs (Hume et al., 2021; Steinbrenner et al., 2020). As a result, our scale measured knowledge and use of newly introduced EBPs.

Although the original scale has been employed in previous research, the present study uniquely used a modified version that was specifically developed to assess the updated EBPs. For example, no prior investigation included an assessment of the Behavioural Momentum Intervention (BMI) (e.g., Alatifi et al., 2023; Alghamdi, 2021b; Alhossein, 2021; Barry et al., 2021; Paynter & Keen, 2015; Sulek et al., 2019). In addition, this is the only study to have included the Ayres Sensory Integration (SI) as an EBP; although others incorporated Sensory Integration (Alatifi et al., 2023; Barry et al., 2021), this term may not necessarily refer to the same underlying concept. Only the model developed by Jean Ayres has been classified as an EBP, while other interventions that address sensory issues are still considered unsupported teaching practices (Hume et al., 2021). Although measuring teachers' knowledge and use of Cognitive Behavioural Strategies and Direct Instruction (recently classified as EBPs) was not unique to this study, it has only been used in a very limited number of other studies (e.g., Alatifi et al., 2023; Alhossein, 2021; Barry et al., 2021).

An important factor influencing the level of knowledge and frequency of use of several teaching practices is the timing of their identification as EBPs and inclusion in practice guidelines and systematic reviews. For example, reinforcement, prompting, fading, and DTT were identified early by the NRC and NPDC and formed the core of the Lovaas and TEACCH programs published decades ago. In contrast, some teaching practices (e.g., BMI,

MMI, ASI) appeared only in the most recent EBP reports (Hume et al., 2021; Steinbrenner et al., 2020). Teachers in this study reported below-average knowledge and use of these newly added EBPs. For instance, Ayres Sensory Integration (ASI) received the lowest knowledge rating among all other EBPs and the second-lowest on the use scale. Few teachers said they had even heard of ASI, and they rarely implemented it in classrooms for children with autism. Similarly, they reported low knowledge and use of BMI, averaging just above the scores reported for Ayres Sensory Integration.

Barry et al. (2021) found that Traditional Teaching ranked highest in the knowledge scale and was among the most frequently used teaching practices. Paynter et al. (2017) and Paynter and Keen (2015) reported moderate knowledge and occasional use of Academic Intervention among teachers and other professionals working with children with autism. The terms Traditional Teaching and Academic Intervention are often used interchangeably to refer to the use of scripted protocols or traditional teaching that employs choral responses and explicit error correction to foster mastery and generalisation of skills.

Recently published studies that employed the Early Intervention Practices Scale, such as Alatifi et al. (2023) and Barryet al. (2024), employed a revised list of EBPs based on the results of a third-generation systematic review (Steinbrenner et al., 2020), yet they appear to have done so selectively. For example, Alatifi et al. (2023) did not incorporate all the EBPs identified by Steinbrenner et al. (2020), omitting EBPs such as Ayres Sensory Integration, Behavioural Momentum Interventions, Cognitive Behavioural Strategies and Exercise and Movement The current study aimed to overcome these limitations, particularly those that are reflected in research conducted in Saudi Arabia (e.g., Alatifi et al., 2023; Alhossein, 2021), by including all of the EBPs that were neglected in those studies. The aim was to provide a more comprehensive evaluation of the knowledge and use of EBPs among Saudi teachers.

7.2.1.2 Individual EM Teaching Practices

Although Steinbrenner et al. (2020) included many teaching practices under the EM category, the modified survey in this study only incorporated such practices in the EM category if they were backed by at least two research studies supporting their effectiveness. Hence, this study uniquely assessed several EM practices (i.e., Exposure, Matrix Training, Punishment, and Collaborative Model for Promoting Competence and Success) for the first time. For instance, both Matrix Training and Exposure were supported by multiple single-case design studies but failed to meet the evidence criteria (Steinbrenner et al., 2020). Our participants rated Matrix Training among the least used and known, and ranked it second to last among all teaching practices. Similarly, Exposure was only used occasionally and was among the practices with below-average ratings. This finding was supported by the qualitative data: none of the EM teaching practices, with the exception of Punishment, were ever mentioned during the focus group meetings. Taken together, these results indicate that teachers in Saudi Arabia are not familiar with the EM practices category.

However, several focus group participants reported using the EM practice of physical or psychological punishment to decrease undesired behaviours. Alotaibi (2015) reported similar results from a study on knowledge and use of Applied Behavioural Analysis by special education teachers in Saudi Arabia, which found that punishment was frequently used in the classroom. It is essential to note that Punishment in the context of this study means the use of aversive consequences such as verbal reprimand and response cost to decrease undesired behaviours (See Steinbrenner et al., 2020). Both Saudi Arabian legislation and Ministry of Education guidelines emphasise the adoption of positive teaching practices to regulate behaviour and prohibit the use of punishment in schools (Alquraini, 2013; Alsalem, 2023). However, the lack of supervision and monitoring in Saudi Arabia may help to explain why Punishment, including physical forms, continues to be used by teachers.

7.2.1.3 Individual UN Teaching Practices

The findings of this study indicate that UN teaching practices were the least known and least frequently used by teachers in Saudi Arabia. Of the remaining UN practices, the Rapid Prompting Method and Facilitated Communication were the best known and most often employed, despite the absence of empirical evidence to support their effectiveness (Schlosser et al., 2019). Rapid Prompting was not included in previous studies that employed the Early Intervention Practices Scale (Paynter et al., 2017). However, high levels of knowledge and frequent use of Facilitated Communication have been reported among teachers of students with autism in different countries (Alatifi et al., 2023; Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015). In contrast, the present study found that other UN practices, such as Auditory Integration Training (AIT), Weighted Vests and Brushing/Wilbarger Protocol, were ranked among the lowest five practices on both the knowledge and use scales; some of them were reported as being used less than once or twice per week, but not every day.

Overall, although UN practices were rated lower in the present study than those in the other two categories, our participants nonetheless reported higher rates of use of UN practices than teachers in other studies. For example, Australian teachers reported that they never or rarely used AIT, Weighted Vests or the Brushing/Wilbarger Protocol (e.g., Paynter et al., 2017; Paynter & Keen, 2015). In contrast, and consistent with the findings of Alatifi et al. (2023), teachers in this study reported that they sometimes or often used the three UN teaching practices mentioned above.

The qualitative data supported these findings, with focus group participants indicating that they continued to use unsupported practices in the classroom and lacked the knowledge to differentiate between EBP and UN. This situation is tentatively attributable to the lack of strict regulation and monitoring in school settings in Saudi Arabia. Another possible

explanation is that the sociocultural environment is one in which many families are mistakenly seeking ‘cures’ for autism through a variety of unsupported treatments such as oxygen therapy, traditional herbs, camel urine and milk, as reported by teachers in our study. The qualitative data also indicated that teachers commonly selected teaching practices based on peers' and parents’ recommendations. Other factors potentially contributing to teachers’ reliance on UN include lack of access to trusted Arabic information, appropriate resources and training. As Paynter and Keen (2015) have proposed, the absence of direct teaching about the limitations and hazards associated with UN teaching practices is a likely reason for the widespread use of these practices among professionals in the autism educational field.

In summary, the results relevant to the first research question indicate that teachers reported EBPs as the practices about which they were most knowledgeable and which they used most frequently, followed by EM and, at the bottom, UN. However, despite this trend, the use of UN practices appears to be more widespread in Saudi Arabia than in other countries where similar studies have been conducted. Close examination of EM practices further indicates that teachers commonly use (and are knowledgeable about) Punishment, but are relatively unfamiliar with the other EM. Among the EBPs, Music-Mediated Intervention and Social Narrative were seen to conflict with cultural values and with the views of some teachers and other key stakeholders and were therefore less frequently used.

7.2.2 Research Sub-question

How do demographic factors such as gender, years of experience, and employment sector relate to the reported knowledge and use of evidence-based, emerging and unsupported practices?

7.2.2.1 Gender

Most previous studies that employed the Early Intervention Practices Scale to examine reported knowledge and use of EBPs did not include gender as a variable (e.g.,

Alatifi et al., 2023; Barry et al., 2021; Paynter et al., 2017; Paynter & Keen, 2015; Sulek et al., 2019). The present study corrected this omission, since male and female teachers in Saudi Arabia work in gender-specific schools, and this may be reflected in their responses. However, comparisons across teaching practice categories (i.e., level of evidence) revealed no statistically significant differences between males and females in either knowledge or use of EBPs, EM or UN. In contrast, Alhossein (2021) found that female teachers reported greater knowledge and more frequent use of EBPs than male teachers. However, that study did not compare knowledge or use of EM and UN between male and female teachers.

The current study also provided insight into the association between gender and reported knowledge and use of 40 specific teaching practices. Female teachers reported using Direct Instruction (EBP), Discrete Trial (EBP), and Exposure (EM) moderately more than male teachers. These were the only statistically significant differences observed; there were no statistically significant differences between male and female teachers in their knowledge or use of all other teaching practices. These findings are consistent with those of Alotaibi (2015), who found that female teachers in Saudi Arabia reported greater knowledge and a higher frequency of use for various Applied Behavioural Analysis teaching practices (e.g., Modelling, Fading, Prompting and Extinction).

In relation to the research sub-question, the results for the demographic variable of gender indicate no differences in knowledge and use of any of the three categories of practice. However, female teachers reported being somewhat more knowledgeable than male teachers about Direct Instruction and Discrete Trial, and used Exposure somewhat more than male teachers.

7.2.2.2 Employment Sector

Comparison by employment sector (i.e., private vs public schools) indicated that teachers in private schools use EM more frequently than their counterparts in public schools.

Private-school teachers also reported using Exposure (EM), Behavioural/Instructional Strategies (EBP), and Auditory Integration Training (UN) more frequently than teachers in public schools. An important finding was that, although the use of Music-Mediated Intervention remains controversial among Saudi teachers, private school teachers reported significantly greater knowledge and use of this practice than public school teachers. This might be attributable to the ability of private school teachers to choose the EBPs they wish to adopt, and the availability of teaching aides, as reported in the focus group data. Other research found that Saudi teachers in public schools are less likely to adopt innovative teaching practices and lack access to essential tools, technologies and teaching aids (Yas et al., 2024).

None of the above-mentioned studies in which the same survey was employed compared teaching practices, knowledge and use between private and public-school teachers. However, Paynter and Keen (2015) investigated the role of centre location as a predictor for knowledge and use of teaching practices. The authors compared professional staff, including teachers, who work in rural areas with those in urban locations. Results indicated that urban participants reported significantly greater knowledge and use of EBPs, while no significant difference was found in the use of UN teaching practices. The authors highlight the need to consider the impact of location when designing and implementing training opportunities to reflect different needs in the target environment.

In relation to the research sub-question, the results for the demographic variable of employment sector indicate that private school teachers use emerging practices moderately more than public school teachers. Results for specific practices indicate that private school teachers are much more knowledgeable about music-based interventions than public school teachers. They also reported moderately higher knowledge about one unsupported practice

(Auditory Integration), and more frequent use of one EBP (Cognitive Behavioural/Instructional Strategies) and one EM (Exposure) compared to public school teachers.

7.2.2.3 Years of experience

One of the anticipated primary outcomes of utilising the KTA framework in this study was to identify the most pressing needs in regard to priority areas for training that will support the future implementation of EBPs and prevent the use of UN teaching practices. As Kitson and Straus (2010) emphasised, the first step toward bridging the gap between knowledge and practice is to identify the current needs of end-users by documenting where the use of EBPs needs to be enhanced and which UN practices need to be eliminated.

Teachers' preparedness and length of experience have been shown to play a vital role in developing their skills and to be associated with increased knowledge of EBPS and a deeper understanding of autism traits (Ballantyne et al., 2021; Devi et al., 2024). This study examined potential differences between teachers in their knowledge and use of EBPs, EM and UN based on their years of experience (less than 5 years, 5-15 years, and 16+ years). Comparative analyses among three groups across teaching practice categories (level of evidence) revealed that teachers with 5-15 years of experience reported using EBPs moderately more than teachers with less than 5 years of experience. Alhossein (2021) reported almost identical results from a comparative study of EBPs knowledge and use among teachers of students with autism in Saudi Arabia. In that study, teachers with more than 10 years of experience reported significantly greater use of EBPs than other groups (5-10 years or less than 5 years. Both studies found no significant difference by age group in EBPs knowledge. Comparable outcomes were reported from other studies that used the self-report method to examine the influence of experience on the knowledge and use of EBPs among teachers, but these were conducted in different socio-cultural contexts, including Australia, China, and the United Kingdom (Ballantyne et al., 2021; Sulek et al., 2019).

Similarly, Barry et al. (2021) found no significant difference by age group in the use of EBPs; however, teachers with 12-15 years of experience reported significantly higher knowledge of EBPs than teachers with 1-3 years of experience.

The current study is one of the first to examine the differences between levels of experience and reported knowledge and use of specific teaching practices. Teachers with 5-15 years of experience reported having more knowledge and use than teachers with less than 5 years of experience in various EBPs, such as Modelling, Task Analysis, and Functional Communication Training. No significant difference was found in relation to any UN or EM teaching practice, with the exception of knowledge of Facilitated Communication, which was moderately higher in the 5-15 years group compared to teachers with less than 5 years of experience; however, the statistical significance of the comparison was marginal. There were no differences in favour of teachers with 16+ years of experience across all comparisons.

A potential explanation for these findings lies in the Saudi educational context. Most teachers in the 16+ years category would not have received specialised training in teaching students with special needs, since universities in Saudi Arabia did not offer Special Education qualifications for teachers until the early 2000s (Alqahtani et al., 2021). In addition, the demographic data collected did not indicate whether participants' years of experience were spent specifically in teaching students with autism. The qualitative data confirmed that many teachers had only recently started working with students with autism after many years of teaching other special education groups.

In relation to the research sub-question, the results for the demographic variable of years of experience indicated that teachers with 5-15 years of experience tended to report using EBPs more than teachers with less than 5 years of experience. Comparisons of individual teaching practices showed that the 5-15 years group reported being more knowledgeable and using a wider range of EBPs than teachers with under 5 years of

experience. They also had moderately more knowledge about one unsupported practice (Facilitated Communication). None of the comparisons favoured teachers with 15+ years of experience.

7.2.2.4 Summary

The results indicate that Saudi Arabian teachers are most knowledgeable about EBPs, followed by EM, and that they are least knowledgeable about UN. The use of these types of practices followed the same pattern. However, the knowledge and use ratings of EM were primarily elevated by Punishment, while teachers showed comparatively little knowledge and use of the other EM practices. Even though UN received the lowest average ratings, the rates of use and knowledge for these practices were still higher than those reported by similar studies conducted in other countries. This likely reflects the specificities of the Saudi Arabian context, where some teaching practices are accepted and sometimes favoured by the wider community. Similarly, the EBPs of Music-Mediated Interventions and Social Narrative are less frequently used by teachers as they conflict with Saudi Arabian cultural values and norms.

Analyses of the influence of demographic differences on knowledge and use indicated no gender differences in the use of the three categories of practices, although female teachers had moderately higher knowledge of two EBPs and more frequent use of one EM. Private school teachers reported more frequent use of EM than public sector teachers. They also reported greater knowledge and more frequent use of Music-Mediated Interventions, as well as more frequent use of Behavioural/Instructional Strategies and Exposure, and higher knowledge of Auditory Integration Training. Comparisons by length of experience found that teachers with 5-15 years of experience reported greater use of EBPs compared to those with less than 5 years of experience. They also reported higher knowledge and use of a range of EBPs compared to the group with less than 5 years of experience.

These findings highlight the complex interplay between evidence-based practices and local educational norms. Also, it underscores the importance of teacher training and policy initiatives to both strengthen knowledge of underused EBPs and ensure their relevance and acceptability within the Saudi educational context.

7.2.3 Research Questions 2 and 3: Overall Findings

- What do teachers of students with autism in Saudi Arabia report as the key contextual barriers that inhibit the implementation of EBPs?
- What strategies do teachers of students with autism in Saudi Arabia recommend for supporting the implementation of EBPs?

The investigation of both barriers and facilitators of EBPs implementation, as perceived by Saudi teachers working with students with autism, yielded multiple viewpoints, reflecting the challenges they encountered in implementing EBPs and ways of overcoming them. The second research question sought to identify key contextual barriers. Analysis of the qualitative data yielded seven overarching themes. One of the primary themes related to issues around limited professional preparation and how universities failed to equip them with the necessary skills, training and knowledge. Teachers also highlighted the scarcity of resources and equipment and inappropriate classroom design as barriers to implementing many EBPs. Another theme revolved around teachers' repeated expressions of concern about their limited knowledge and awareness of the most recent research on EBPs, as well as the difficulties involved in fully implementing teaching practices (what is referred to as treatment fidelity). The final theme was developed to reflect barriers to action in the form of both internal and external factors, including administrative and structural obstacles, and the practical and emotional challenges they faced as a result.

The third question addressed teachers' recommendations for improving and supporting the implementation of EBPs in autism educational settings in Saudi Arabia. The

first theme developed to answer this question focused on the need for tailored EBP training. Teachers emphasised that overcoming barriers such as lack of knowledge and inadequate university preparation required effective training in EBPs that was specifically designed to address their needs. The second theme was organised around the need for collaboration with parents and other stakeholders if EBPs are to be successfully adopted in the classroom. The final recommendation was to ensure that EBPs were relevant to the Saudi context. In other words, there needed to be a better match between EBPs and the wider Saudi Arabian educational system, local values and Islamic beliefs. Suggestions included optimising local research on EBPs, modifying some content, enhancing access to relevant publications and providing Arabic translations of research.

In relation to the second research question, the findings from the qualitative component indicated that, while many of the identified EBPs barriers were specific to the Saudi context, they generally aligned with international research studies and systematic reviews (Alexander et al., 2015; Barry et al., 2020). For example, the literature identifies education, training and preparation as a key factor influencing the adoption of EBPs among teachers of students with autism (Devi et al., 2024; Kelly et al., 2024; Sanz-Cervera et al., 2017). This echoes a developed theme in this study, “The University Failed to Prepare Me”, in which teachers pointed to the lack of appropriate pre-service teaching and planning as a serious barrier to the implementation of EBPs. This lack of preparation is supported by the quantitative data, which showed that three-quarters of the participants did not hold a degree with a specialisation in autism.

7.2.3.1 Universities Fail to Prepare Teachers

Compared to long-established institutions in Western countries, recently established universities and special education departments in Saudi Arabia are likely to face a variety of challenges in designing evidence-based curriculum for pre-service teachers (Kelly et al.,

2024). Teachers complained that many university lecturers, most of whom were recruited from other countries, lacked knowledge of Saudi culture and rarely linked teaching curricula to local school regulations and other contextual factors. Similarly, Ibrahim and Alotaibi (2024) reported that misalignment between theoretical knowledge and real-world practice was one of the central barriers for EBPs implementation among teachers in Saudi Arabia.

Teachers also identified insufficient field training during university preparation as another barrier to EBPs implementation. Specifically, they criticised the system of limiting field training to only one school semester, the lack of classroom observation and feedback, and insufficient opportunity to work with students with autism. Yet, as Alasmari (2021) has reported, pre-service Saudi teachers who had an opportunity to work directly with students with autism during their university field training were more likely to have a positive attitude toward these students and EBPs.

7.2.3.2 Tailored Training

In relation to the third research question, teachers recommended improved access to Continuous Professional Development (CPD) and support as potential solutions to the problem of inadequate knowledge and use of EBPs. In this context, Alhossein (2021) reported that attendance at more than five training programmes was associated with greater EBPs knowledge and use among teachers of students with autism. Similarly, Barry et al. (2021) compared self-reported knowledge and use among teachers based on the training they had received, and found that those with more exposure to training in autism education (30+ hours) had significantly higher knowledge and use of EBPs.

Further, Barry et al. (2024) reported that increased training opportunities was associated with greater use of EBPs among general education teachers. In a study of barriers to EBPs usage specifically to teach social skills for high-functioning autism, Silveira-Zaldivar and Curtis (2019) found that teachers enter into employment without acquiring the necessary

skills to provide such training. In the present study, several suggestions were made to address this issue, including providing ongoing training, coaching and mentoring for both special and general education teachers. The provision of tailored EBPs training was specifically identified as a facilitator to overcome barriers such as lack of EBPs knowledge and the failure of universities to provide adequate preparation. The findings of this study are consistent with those from the literature more broadly, which concludes that more training for pre-service and in-service teachers is associated with greater knowledge and use of EBPs (e.g., Alexander et al., 2015; Harbin et al., 2024; Ibrahim & Alotaibi, 2024; Sanz-Cervera et al., 2017).

The findings from the qualitative component further support the need for tailored training driven by teachers' needs and preferences, and for them to be allowed to participate in the selection of content and mode of delivery. Other studies report similar results. For instance, Ibrahim and Alotaibi (2024) found that in-service training for teachers of students with autism in Saudi Arabia failed to prioritise topics or practices that were of importance to them. Similarly, Silveira-Zaldivar and Curtis (2019) reported that teachers of students with autism in the United States were dissatisfied with the training focus on academic skills to the neglect of evidence-based social skills interventions. Failure to address teachers' training needs has also been associated with a lack of motivation to attend training courses and inefficient use of time and resources (Ibrahim & Alotaibi, 2024). Finally, Barnhill et al. (2011) argued that depth of training is a vital aspect of course design for teachers of students with autism, especially for those who teach heterogeneous groups with severe symptoms, including non-speaking students with autism.

7.2.3.3 ABA Training and Supervision

Although Applied Behaviour Analysis (ABA) practices and strategies were among the top-rated teaching practices in this study, teachers specifically indicated that training courses

should prioritise ABA practices. Participants demonstrated a very positive attitude towards ABA practices, and expressed their desire to learn more about them. However, they identified a lack of training opportunities, certified trainers and reliable information as a barrier to implementing ABA practices and strategies. In line with this finding, Almughyiri (2024) and Almutlaq (2021) found that teachers of students with autism in Saudi Arabia were not satisfied with available ABA training opportunities, with some indicating that they had been studying ABA practices independently. Recently, Kelly et al. (2024) suggest providing more training opportunities and access to ABA resources, establishing an official license for ABA, addressing the gap in local research and establishing a university coursework specialisation in ABA. Odom et al. (2020) support these suggestions, arguing that there is a more pressing need to establish training programs and enhance competencies in countries where ABA is relatively new.

In this context, participants in this study reported that there is a shortage of trainers who have a strong background in autism education and, specifically, EBPs. They also pointed to the random selection of training course topics and, in those programs targeting teachers of students with autism, the focus is usually on autism traits and diagnostic criteria rather than teaching practices. In addition, most training courses provided by the Ministry of Education in Saudi Arabia are designed for general education teachers and rarely address the needs of teachers of students with autism. Also, very few leaders and decision-makers in the Ministry of Education have specialist knowledge of autism.

7.2.3.4 Ill-equipped and Poorly Designed Classrooms

Consistent with this study's findings, Ibrahim and Alotaibi (2024) reported that the absence of appropriate tools and equipment can hinder the successful implementation of EBPs. As observed by the participants in the present study, while the Ministry of Education supplies schools with educational equipment and teaching aids, they do not necessarily

provide facilities that are specifically designed for students with autism. They added that the heterogeneity of this group necessitates the availability of specialist teaching aides. The survey results suggest a possible relationship between the lack of teaching aides and equipment and the use (or non-use) of some EBPs. Those requiring the most support of this kind, such as Augmentative and Alternative Communication, Ayres Sensory Integration, and Music-Mediated Intervention, were rated among the least frequently used. On the other hand, almost all the top-rated teaching practices in use by teachers were those that need no teaching aides and equipment or rely on minimal resources.

In this context, Alasmari (2021) investigated barriers to the use of assistive technology (AT) specifically, finding that most teachers of students with autism in Saudi Arabia reported a lack of AT resources as a key implementation barrier. It is important to note here that, while the teachers in Alasmari's (2021) study reported a lack of knowledge and training on how to integrate AT into classroom teaching activities, the focus group participants in the current study only discussed the provision (or lack) of relevant resources. A scoping review of EBP barriers and facilitators by Barry et al. (2020) identified a lack of resources as the most commonly reported school-level barriers. Specifically, lack of materials and resources was identified as a barrier across intervention types, including social skills training (Locke et al., 2015; Silveira-Zaldivar & Curtis, 2019), naturalistic behavioural interventions (Wilson & Landa, 2019), visual supports (Donato et al., 2014) and social stories (Alotaibi et al., 2016).

The physical structure of classrooms was perceived as another barrier by many teachers in this study. Similarly, Block (2018) found that classroom design, including lighting, noise, colour and physical arrangement, all impacted students' level of engagement, while a design tailored to the needs of students with autism could enhance teaching activities and increase students' attention. According to teachers in the current study, Saudi classrooms

were originally designed for general education students; thus, they are neither suitable nor sensory-friendly for students with autism. They pointed to particular drawbacks, such as the limits the existing design imposes on one-to-one teaching and on the implementation of various EBPs, such as a structured work system. Finally, the lack of sports facilities in schools was viewed as a barrier to Exercise and Movement (EBP). Teachers in this study explained that exercise is not integrated into the curriculum, and many schools do not have a suitable outdoor field or indoor gym for students with autism. Female teachers indicated that, in addition to the lack of sports facilities, many girls were hesitant to participate in sports due to cultural and religious restrictions that urge modesty and dress codes, an observation supported by Nahari and Makopoulou (2024).

7.2.3.5 Barriers to Action

Once again, lack of knowledge and proper training was not the only barrier to implementing EBPs. Under the theme of "Administrative and Structural Obstacles", focus group participants argued that while many EBPs are feasible and easy to implement, administrative or structural restrictions formed a barrier to action. As indicated in the multi-level implementation quality framework by Domitrovich et al. (2008), macro-level policy factors have the potential to influence the adoption of EBPs and the fidelity of interventions, as well as promoting a positive attitude toward EBPs. Teachers in this study identified a mismatch between policies and curriculum design on one hand, and the characteristics and heterogeneity of students with autism on the other. For example, the establishment of educational goals and a unified curriculum based on the child's age or educational level acts as a barrier to the use of EBPs and the integration of individualised education plans (IEPs).

It is important to note here that policymakers and school administrators in Saudi Arabia hold a positive attitude toward EBPs and are increasingly demanding that teachers implement them in the classroom. However, they are unaware that many regulations issued

by the Ministry of Education obstruct the use of EBPs in the classroom. A similar finding was reported by Alghamdi (2021b): teachers of students with autism in Saudi Arabia also expressed the view that many regulations and guidelines did not align with or facilitate the implementation of EBPs and did not take into account the unique characteristics of students with autism. Further support comes from Locke et al. (2015), who reported that district and school policies could limit opportunities for the implementation of EBPs for students with autism. An important finding is that the participants in this study and those in Alghamdi's (2021) investigation identified the establishment of communication channels with the Ministry of Education as an urgent necessity to enable them to convey their voices and needs and to participate in decision-making about how to increase adoption of EBPs.

7.2.3.6 Collaborative Team as Facilitators

Teachers in this study indicated that successful adoption and appropriate implementation of EBPs require building a collaborative team that includes parents, administrative staff, related specialists and assistant teachers. Consistent with Silveira-Zaldivar and Curtis (2019), focus group participants highlighted the importance of school leaders adopting a positive attitude towards, and support for the inclusion of EBPs. According to Locke et al. (2017), organisational-level support centres around principals' attitudes, which influence the decision to accept or reject new interventions. Significantly, the qualitative data in the present study indicate that administrative staff, including principals, rarely objected to or encouraged the use of EBPs; this may be due to their unfamiliarity with autism as a diagnosis or a lack of knowledge about EBPs. In line with Cook et al. (2012), teachers in this study recommended that parents or caregivers of students be involved in the multidisciplinary team that selects EBPs and supports the development of the IEP. Finally, although time has been found to be a key barrier to the planning and execution of EBPs (Barry et al., 2020), teachers in this study argued that time in itself is not an obstacle. They

believed that time could easily be saved by employing assistant teachers who could work alongside them in the preparation and implementation of EBPs, as well as in classroom management.

7.2.3.7 Making EBPs Contextually Relevant

This theme was specifically developed to emphasise the importance of local culture, language and religion in determining the applicability of EBPs. While this study did not directly explore the influence of cultural context on the knowledge and use of EBPs, the qualitative investigation suggested an outline of the kinds of modifications that would improve the fit between EBPs and the local environment. This theme resonates with Moore et al. (2021), who highlighted that implementing EBPs in a new social, cultural, geographic or economic context without appropriate adaptation strategies is likely to lead to undesirable outcomes. As Evans et al. (2019) have observed: "assuming that a history of what has worked elsewhere can guarantee the future success of similar action in a new time and place is therefore problematic" (p. 481).

More specifically, Ballantyne et al. (2021) argue that teachers of students with autism in Eastern societies may face unique cultural challenges in adopting knowledge about autism and related teaching practices. This was evident in the focus group discussions, where participants noted that Saudi society still adheres to many traditional beliefs, stigmatises neurodevelopmental conditions, and socially excludes special needs individuals. This situation needs to be addressed at the macro-level if EBPs are to accommodate local norms and attitudes. Focus group participants made three specific recommendations to address this problem: modifying some EBPs to meet cultural expectations; conducting local research; and providing information in Arabic. They agreed that low-context ABA techniques, such as prompting, extinction and reinforcement, are appropriate for the Saudi context without any adjustment. However, practices that rely on content, such as video modelling, social

narratives or scripts, should be tailored to suit the unique local context and not conflict with customs or religion.

Few other studies have explored the influence of Saudi culture on teachers' knowledge and use of EBPs. An exception is the work of Alotaibi et al. (2016), who identified cultural differences as a barrier to the implementation of Social Narrative and emphasised the importance of ensuring that materials fit the local context. It should be noted that teachers in the present study were well aware that adherence to the original protocols is crucial to ensure the fidelity of the intervention. However, it would be possible to create modifications that do not affect the key principles of the procedure; rather, the focus should be on employing culturally appropriate stories and characters in the development of practices such as social narratives, scripts and video modelling.

Another potential source of confusion is the use of multiple terms for EBPs in the autism field. As the teachers in this study observed, the problem is exacerbated when the translation of these terms does not take account of the local context, when terms are translated literally, or when multiple translations are used for the same teaching practice. Alghamdi (2021b) has also expressed concern that teachers in Saudi Arabia are confused about many EBP terms, attributing this in large part to inaccurate translations of Western literature. This further highlights the lack of sources in Arabic, since most published work on EBPs is written in English and produced in Western countries. Therefore, qualitative findings of this study are parallel with those of others, such as Alallawi et al. (2020); Alghamdi (2021b), who assert that there is a crucial need to provide accurate and culturally appropriate English-to-Arabic translation for teachers who have minimal access to EBPs publications that are disseminated in the English language.

In relation to facilitators for the implementation of EBPs, participants identified local research and participatory research design to enable teachers to contribute classroom-relevant

information. Various scholars have argued that use of culturally inappropriate research findings and the implementation of EBPs in different contexts without adaptation can adversely impact the fidelity and effectiveness of the interventions and place a significant burden on end users (Haines et al., 2021). While identifying the barriers to and facilitators of the implementation of EBPs is a necessary first step in reducing the research-to-practice gap, Guldberg (2017) argues that the adoption of participatory research approaches is equally or more important to ensure that research outcomes are directly applicable to the local context. Many of the participants in this study were firmly of the view that the availability of local research would enable them to access information easily, overcome the language barrier, and find solutions that reflected their own situation.

7.3 Limitations and Recommendations for Future Research

Like all research, this study had several limitations, particularly in relation to aspects of methodology. Identifying such limitations does not necessarily undermine the findings. They are acknowledged for purposes of transparency and to inform further research. This section discusses these limitations and makes recommendations to address them in future studies.

7.3.1 Quantitative Component

The collection of quantifiable data from the survey design allows for various statistical analyses that mathematically uncover patterns and define relationships across various observations (John, 2010; Schutt, 2019). Survey design also allows for the distribution of questionnaires in large samples in diverse geographical regions, with the ability to maintain confidentiality and minimise bias. While the advantages of survey design are substantial, certain drawbacks may appear due to the design features and their application. The key limitations related to the use of the survey in this study are discussed below.

7.3.1.1 Cross-Sectional Design

Regardless of the popularity of cross-sectional design, Rindfleisch et al. (2008) assert that completing a survey at a single point in time is generally perceived as a common method variance (CMV) bias. In the present study, the use of a cross-sectional design in the survey component provided descriptive insight into the current teaching practices that are known to and used by teachers of students with autism in Saudi Arabia and identified the most pressing training needs. However, there is no claim that the findings can be generalised. Future research could benefit from utilising other research methods, such as longitudinal surveys, successive independent survey design, or data and methods triangulation.

7.3.1.2 Self-Report Data

Collecting self-reported information via a survey allows for gathering a large amount of data in a short period and at a lower cost. However, reliance on self-report measures to evaluate teachers' knowledge and use of EBPs, in this study, was identified as the most common limitation in previous studies (Alatifi et al., 2023; Alhossein, 2021; Barry et al., 2024; Paynter et al., 2017; Paynter & Keen, 2015; Sulek et al., 2019). This is because teachers may have reported inflated levels of knowledge or practice (Gitomer & Zisk, 2015). This limitation could be addressed in future research by using other methods, such as direct observation, video recording or implementation of a fidelity checklist, to collect more accurate, unmediated data about teachers' knowledge and use of EBPs.

7.3.1.3 Survey Design and Delivery Mode

There are inherent limitations in Likert-scale data that are difficult to overcome. For example, the ordinal data it generates do not provide equal and consistent distances between values. Accordingly, many researchers and statisticians recommend against the use of parametric tests (Jamieson, 2004; Roever & Phakiti, 2017). However, parametric tests are permitted when data normality and adequate sample size conditions are satisfied (Mircioiu &

Atkinson, 2017; Sullivan & Artino Jr, 2013). An additional limitation is the forced-response feature. This may result in random responses to questions about teaching practices with which participants are unfamiliar or that are not suitable for the age group the respondent is teaching.

A significant concern in this study's design is the length of the survey, which might account for the high dropout rate (Cobern & Adams, 2020). Teachers were asked to rate their knowledge and use of an extensive list of 40 teaching practices. A lengthy survey increases cognitive load and potentially leads participants to discontinue; hence, only motivated teachers might complete it, leading to sampling bias. Another concern relates to the presentation of the scales. Both scales were presented simultaneously to facilitate the rating of knowledge and use of each teaching practice. However, this could have increased question order bias, as participants tended to rate the frequency of use consistently lower than the level of knowledge in all teaching practices, without exception. Accordingly, the significant correlation found in this study between knowledge and use scales may reflect trends rather than definite statistical outcomes. For future research, it is highly recommended that these variables be examined in separate surveys and/or by different collection methods.

Finally, the survey was distributed through an online platform. Online surveys are subject to a range of limitations, including but not limited to low response rate, sampling errors, inability to guide and personally assist responders, and the difficulties related to internet access or internet literacy (Gürbüz, 2017; Stockemer & Bordeleau, 2023). Several procedures were adopted to minimise the impact of these limitations. For example, to address the low response rate, the researcher sent reminders to potential participants and visited many schools to meet teachers in person to discuss the significance of their participation. A short video was also created and distributed to provide step-by-step instructions to assist teachers in completing the survey and avoiding any confusion. Despite the extensive efforts to

distribute the survey to dozens of schools in Saudi Arabia, the low response rate and high dropout percentage were the most significant constraints encountered while collecting the survey data.

7.3.1.4 Sampling Technique and Sample Size

Purposive (non-probability) sampling was used in this study to select participants who met specific criteria. Purposive sampling is a widely adopted technique for intentionally recruiting participants with specific characteristics and in circumstances where time and resources are limited (Tongco, 2007). Purposive sampling often involves the researcher setting the inclusion criteria, which carries the potential risk of selection bias and makes it difficult to generalise the results beyond the study sample.

In addition, although the survey was distributed to the five different geographical regions of Saudi Arabia, teachers from the Eastern region represent two-thirds of the total sample. This is a concern because geographical bias could limit external validity and fail to provide a comprehensive foundation for future decision-making. If the aim of future research in Saudi Arabia is to provide a broad picture of the current level of teachers' performance and knowledge in relation to EBPs, a larger and more representative sample from different geographical regions is required. However, if the aim is to provide evidence for the development of specific interventions, then the scope of the sample should be reduced to shed light on context-specific needs. With the appropriate funding, future research in Saudi Arabia could also adopt more advanced sampling techniques, such as random sampling, to generate more trusted and generalisable results about the knowledge and use of EBPs and other teaching categories among teachers of students with autism.

7.3.2 Qualitative Component

Qualitative research methods have merit and distinctive characteristics in providing a unique insight into complex phenomena (Creswell & Poth, 2016; Lim, 2024). In this study,

focus group discussion was utilised to investigate the challenges that lie in the implementation of EBPs and the possible solutions to support the use of EBPs as perceived by teachers. The main limitations of the focus group design in this study are discussed below.

7.3.2.1 Scope of the Investigation

The focus group discussions investigated the barriers to and facilitators of EBPs as perceived by teachers of students with autism in Saudi Arabia. The exclusion of other key stakeholders, such as school administrators, non-teaching staff and representatives of the Ministry of Education, can be considered as a limitation. Failure to examine the diverse roles, perspectives and experiences of these groups results in a less than comprehensive understanding of this complex phenomenon. It is therefore recommended that future research investigate the macro-level factors that influence the adoption of EBPs and explore the use of an interdisciplinary approach. School administrators and other stakeholders could be included in a multi-level or sequential investigation to broaden the scope of the inquiry and compare perspectives.

The focus group meetings were guided by a wide range of questions that encouraged participants to engage in deep discussion about their perspectives on barriers and facilitators at macro, school and individual levels. However, the discussion was necessarily broad, and did not focus on barriers and facilitators for specific teaching practices, such as Social Narratives/Stories, or a particular set of EBPs, such as technology-based interventions. Additionally, although the participants met the inclusion criteria, no detailed information was collected on their demographic characteristics.

Many opportunities exist for further research exploring the barriers and facilitators of EBPs among teachers of students with autism in Saudi Arabia. First, the current study's findings could be extended by examining their relevance across different settings. Second, a larger survey could be conducted to produce more generalisable results. However, it is

recommended that this be accompanied by further qualitative research using small samples, since these methods are preferred in Implementation Science research, where the aim is to bridge the research-to-practice gap. Third, comparative studies could shed more light on the effect of demographic characteristics and contexts on barriers and the kinds of support needed to enhance EBPs implementation.

An important future direction for research in this field is the potential role and benefits of AI-based tools in supporting the implementation of EBPs in classroom settings. Artificial intelligence (AI) was not mentioned in any of the focus group meetings in this study. This is primarily because the focus group questions were created early in the emergence of AI, questions about the topic were not included in the study protocol, and it was not raised in any group discussion. Recently, however, several studies have considered the potential role of IA-based tools for supporting the implementation of EBPs in educational settings to support students with autism (Balikci, 2026; Hussein et al., 2025; Lampos et al., 2021; Tsapanou et al., 2025).

Therefore, AI presents new opportunities for future studies to: (1) support the use of EBPs for planning and decision-making in the classroom; (2) automate assessment and data collection; (3) build and share regulatory and ethical guidelines for using AI to support EBP implementation; (4) promote inclusive education; (5) evaluate the feasibility and cultural fit of EBPs in diverse societies; (6) create and share learning platforms based on recently published EBPs; (7) use AI to review research and determine the effectiveness of teaching practices and identify EBPs.

7.3.2.2 Data Collection Procedures

The focus groups for male and female teachers were conducted using different modes of delivery (in-person vs virtual mode). This might have impacted the role of the moderator (the researcher) and the communication style in the meetings. For example, the researcher

could take notes during Zoom meetings, but not during in-person meetings because it is considered disrespectful in Saudi culture to appear to be occupied in another task while engaged in conversation. Moreover, female participants tended to provide longer answers and to digress from the topic more frequently, while male teachers were more likely to exhibit dominating behaviour and to challenge others' viewpoints. However, all meetings followed similar procedures and had identical discussion points, so it is unlikely that these differences impacted the trustworthiness of the results.

Furthermore, a limitation of the focus group design in this study is the potential for socially desirable responses (Paulhus & Vazire, 2007). Teachers in this study were repeatedly assured that all collected data would be confidential. However, they may have felt pressured to give the 'right' answer when they communicated with their peers during the discussion. Several ways of minimising social desirability bias in qualitative investigations have been suggested. These include utilising a mixed-methods approach to data collection and triangulation, which would enhance the credibility and dependability of the findings (Ahmed, 2024). Bergen and Labonté (2020) recommend holding meetings in a private place far from the school authority, asking indirect questions, probing participants for specific answers and examples they encounter on a daily basis, and emphasising that challenges are faced in any working community.

7.3.2.3 Data Analysis Procedures

A possible limitation of the analysis procedures is the inclusion of data from the first two focus group meetings, which also served as a pilot test. However, possible data contamination concerns were addressed, and no significant change to the focus group agenda or design was made in the remaining meetings. Moreover, it was not possible to use member checking to verify the accuracy of the data due to restricted time and the unavailability of participants.

The researcher in this study adhered to the recommended procedures for reporting and analysing qualitative data (Braun & Clarke, 2022; Tong et al., 2007). However, the reflexive approach adopted in both coding and theme development might have introduced some bias. Another limitation relates to the translation of Arabic-language materials into English. Many words and phrases are very difficult, and sometimes impossible to translate without some loss of meaning, tone or style. Esposito (2001) discusses the impact of translators and translation techniques on the collection and analysis of qualitative data. The author argues that translation does not simply involve transferring a word in one language to another but is a process that includes interpretation of idiomatic expressions, culturally embedded meanings and connotations.

Alzyood et al. (2020) identify various challenges faced by Arabic-English qualitative research. They present an example of a professional bilingual research collaboration that incorporated techniques such as back-translation and expert review, noting that the outcome nonetheless remains at risk of loss of meaning or distortion of cultural nuance. The potential for such losses and misinterpretations is even greater in high-context communication cultures, such as Saudi Arabia (Hofstede, 2011; Ibrahim & Alotaibi, 2024). It is vital for future researchers collecting data from Arabic focus group discussions to be aware that such contexts often generate implicit and cultural cues rather than explicit messages. Therefore, careful translation procedures must be used when shifting from high-context Arabic to low-context English linguistic structures in order to ensure that translations are tied to context and convey the embedded cultural meaning (Gudykunst, 2004; Olsen & Kelly, 2020).

7.4 Contributions of the Study

This section discusses the implications of the findings for research, policy, practice, theory and methodology. A common outcome of research on teaching knowledge and

practice categories is the identification of priority areas for training. In the present study, the qualitative data provided particularly valuable insights into this and other key issues.

7.4.1 Empirical Contributions

Despite the limitations of the study's methods, the findings provide previously unavailable information on the status of autism education in Saudi Arabia, particularly in relation to addressing the research-to-practice gap. They provide a database for future research in Saudi Arabia and other developing countries where autism-related educational research is in short supply. Strengthened research capacity in these countries can significantly enhance diagnosis, services, treatments and interventions (Sulaimani & Gut, 2019; Zakirova-Engstrand & Yakubova, 2024). The present findings are of special relevance for addressing the needs of teachers, who represent the front-line workforce.

Very few studies in Saudi Arabia have utilised a similar method to collect information about the knowledge and use of EBPs among teachers of students with autism. Hence, the present findings make an important empirical contribution. The study generated an updated list of EBPs that can be used to guide future research. The findings can also stimulate further work to investigate the factors underlying teachers' performance and to identify similarities and differences in performance based on different variables.

The qualitative data provides important insights into the contextual barriers that may hinder the use of EBPs among teachers of students with autism in Saudi Arabia. Although many are similar to those identified in studies in other countries, some barriers are unique to the Saudi context. As one of only a very few such investigations, the study could usefully be replicated in Saudi Arabia to enhance the transferability and credibility of findings (Alatifi et al., 2023).

7.4.2 Theoretical and Methodological Contributions

The present study demonstrates the value of implementation science (IS) in guiding the integration of EBPs as suggested by the most recent systematic reviews (Lee et al., 2025). The qualitative findings in particular highlight the need for more flexible and participatory approaches that allow for teachers' involvement. Overall, they support Guldberg's (2017) call for the use of a wide range of methodologies to explore the factors that enhance the implementation of EBPs rather than simply validating the effectiveness of interventions.

This study was the first to employ the knowledge to action (KTA) model (Graham et al., 2006) as an IS framework to examine ways of improving the implementation of EBPs among teachers of students with autism in Saudi Arabia. The theoretical insights of the KTA and other determinant IS frameworks allow for theory-driven interpretation of barriers and facilitators of EBPs implementation, and could suggest broader applicability of the findings. Although not all phases of the action cycle were employed, the findings indicate a practical need to expand the use of KTA in the special education field. Along with Luskin-Saxby and Paynter (2018), this study provides a clear structure and methodological guidelines on the choice of methods to support the autism knowledge translation processes.

7.4.3 Contributions to Policy and Practice

The gap between research, policy and practice cannot be bridged entirely, as research, development and production are ongoing processes (Mallonee et al., 2006). However, it is always possible to minimise the gap. The findings of this study suggest that greater effort is needed from the Ministry of Education in Saudi Arabia to address the issues associated with the implementation of EBPs in the classroom. Teachers of students with autism provided insight into what they consider barriers to implementation, and suggested potential ameliorative strategies. Both the qualitative and quantitative evidence can inform the

directions followed by educational leaders and policymakers. A summary of practical recommendations for the Ministry of Education is presented below.

- The survey indicated that many teachers are knowledgeable about EBPs and report that they use them. However, it is important for school administrators and supervisors to monitor the daily practice of teachers to assess their adherence to protocols.

- Some EBPs that were recently added to the systematic reviews on autism education were among the least known and used. This highlights the need for the Ministry of Education to provide trusted information resources and continuously update its publication, the *Teacher's Comprehensive Guide to Autism Intervention Programs.*

- Teachers reported moderate use of unsupported teaching practices for students with autism. Such practices have no evidence of effectiveness and can be harmful. This reinforces the importance of ongoing monitoring and official policies prohibiting their use.

- Specifically, there is an urgent need for policies to address the use of behavioural assaults such as punishment, and to train teachers in the selection and implementation of EBPs that are designed to deal with challenging behaviours.

- There is a pressing need for EBPs training for teachers of students with autism that is tailored to context-specific needs. It is also essential to involve teachers in determining training priorities, content and delivery methods.

- Teachers emphasised that the successful adoption and implementation of EBPs is contingent on overcoming various types of barriers. This implies the necessity for collaborative work of related parties to identify multi-layer and tailored solutions.

- Due to a lack of the necessary equipment and tools, teachers indicated that they are unable to implement EBPs. Therefore, it is important to direct more funds towards classroom preparations and teaching aids.

- The lack of effective interaction between teachers and the Ministry of Education highlights the need to establish appropriate communication channels to allow teachers to participate actively in decision-making, have their voices heard, and identify their needs.

- Many of the barriers identified in this study result from educational regulations and rules that do not consider the nature and diagnostic features of autism. Policy changes and revised educational regulations should be determined through collaboration with teachers and experts in autism.

7.5 Conclusion

Bridging the research-to-practice gap represents a persistent challenge in autism education. As this thesis has shown, this gap does not result from the absence of relevant EBPs, but from the limited implementation of these teaching practices in real-world environments, including schools and clinical settings (Lee et al., 2025; Macdonald et al., 2020). Students with autism bear the brunt of this failure, as they are deprived of the opportunity to benefit from teaching practices that could help them to improve difficulties in core areas of learning and development (Dingfelder & Mandell, 2011). In the school setting, teachers cannot be held solely responsible for this situation. Rather, the adoption and implementation of EBPs depends on cross-functional collaboration and preparation across a variety of spheres (Atas et al., 2023). In response, many prominent researchers have recommended the application of IS frameworks and models to reduce the gap between knowledge and practice (Boyd et al., 2022; Guldberg, 2017; Lee et al., 2025; Odom et al., 2020).

According to Boyd et al. (2022), autism educational research has reached a stage of maturity in relation to evaluating intervention efficacy and is poised to move to a science of intervention implementation and sustainment. Although the authors do not underestimate the need to continue “discovering and validating practices that support autistic individuals” (p.

569), they argue that more attention should be paid to the application of scientific theories and conceptual frameworks to research aimed at identifying a mechanism for transforming knowledge into practice. The present study was initiated in response to this trend and to address the urgent need for improved teaching practices in autism education settings in Saudi Arabia (Alatifi et al., 2023; Sulaimani & Gut, 2019). Specifically, the study aimed to investigate knowledge and use of various teaching practices and identify contextual barriers to and supportive elements for the adoption and implementation of EBPs as perceived by teachers of students with autism in Saudi Arabia.

Guided by the action cycle of the KTA (Graham et al., 2006), the current study employed a mixed-methods design involving a quantitative survey and qualitative focus group discussions to answer different research questions. Results from analysis of the numerical data confirmed the concern expressed in the literature regarding the widespread use of UN teaching practices among teachers of students with autism. Although EBPs were ranked higher than most of the EM and UN teaching practices, Saudi teachers continued to employ UN practices at an average rate higher than that of teachers in Western countries. For the first time, comparative analysis was undertaken to explore the role of demographic factors. Due to the relatively small sample size and reliance on self-report data, the results should be interpreted with caution. However, this analysis provides a foundation for further investigation of teachers' support and training needs based on demographic characteristics.

A number of important themes were developed through analysis of the qualitative data. In particular, lack of knowledge of EBPs and inadequate pre-service training emerged as prominent barriers to implementation, thus helping to explain many of the quantitative results. In response to the lack of knowledge, teachers emphasised the need for tailored EBPs training that aligned with their needs and preferences. Additionally, while many of the themes had previously been identified in the international literature, the study has made an

original contribution to the important task of making EBPs contextually relevant. Saudi teachers suggested various initiatives, including the promotion of local efficacy studies, adaptation and modification of existing EBPs, and providing English-to-Arabic translation of relevant EBPs publications and resources. Importantly, the barriers and facilitators identified in this study can serve as indicators of implementation strategies that are applicable to various autism educational settings in Saudi Arabia. However, it should be borne in mind that IS frameworks always require that barriers should be identified by the target end-users, and they must be periodically reviewed as circumstances change.

A key early step in the application of IS frameworks and models in studies of the research-to-practice gap is to conduct a thorough investigation of implementation barriers and facilitators. The present study has generated previously unavailable information about the use of specific practices by teachers of students with autism in Saudi Arabia and their perspectives on EBPs barriers and facilitators. The empirical evidence has the potential to provide a baseline for directing both policy and practice development in Saudi Arabia for the benefit of students with autism. The findings further highlight the key role of teachers in decision-making around EBPs selection and implementation. From a theoretical standpoint, the results support the call for a paradigm shift in research methodology and the utilisation of the IS framework to examine the multiple relationships between research findings and the contextualised application of EBPs in practice.

The ultimate purpose of this study was to inform best practices in educational services for students with autism in Saudi Arabia. This aligns with Saudi Arabia's Vision 2030, which includes an emphasis on investment in human capital. To this end, the findings will be disseminated to relevant educational stakeholders in Saudi Arabia. One of the key messages will be the importance of involving teachers in decision-making and research. Up to now, the absence of their voices and of appropriate venues in which to share their concerns and needs

has contributed significantly to the existence of the research-to-practice gap. As such, a final recommendation is that future efforts towards a solution must involve the active participation of teachers of students with autism in the development of a transformational research plan to identify local gaps and contextual solutions to the problem of continued use of unsupported teaching practices in schools in Saudi Arabia, and to develop and encourage the implementation of EBPs that align with local needs.

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Appendices

Appendix A: Ethics Approval Letter – The University of Sydney

THE UNIVERSITY OF SYDNEY

Research Integrity & Ethics Administration
HUMAN RESEARCH ETHICS COMMITTEE

Thursday, 13 April 2023

Dr Jessica Zanuttini
School of Education and Social Work Academic Operations; Faculty of Arts and Social Sciences
Email: jessica.zanuttini@sydney.edu.au

Dear Jessica,

The University of Sydney Human Research Ethics Committee (HREC) has considered your application.

I am pleased to inform you that after consideration of your response, your project has been approved.

Details of the approval are as follows:

Project No.:	**2023/174**
Project Title:	**Knowledge to Action Cycle: Strategic Planning to Transform Effective Autism Intervention into Sustained Practice Among Saudi Arabian Teachers**
Authorised Personnel:	**Zanuttini Jessica; Aldughaysh Khalifah; Little Cathy;**
Approval Period:	**13/04/2023** to **13/04/2027**
First Annual Report Due:	**13/04/2024**

Documents Approved:

Date Uploaded	Version Number	Document Name
05/04/2023	Version 2	Participant Consent Form for Focus Group _ Final
05/04/2023	Version 2	Participant Info Statement _Focus Group_ Final
05/04/2023	Version 2	Participant Info Statement- PIS_Survey 2 Final
05/04/2023	Version 2	Participant Info Statement- Survey 1_Final
05/04/2023		Survey 1
05/04/2023		Survey 2

Special Condition/s of Approval

- Please enter the ethics approval number (2023/174) in the footer (and body, where relevant) of all public-facing study documents.

Condition/s of Approval

- Research must be conducted according to the approved proposal.
- An annual progress report must be submitted to the Ethics Office on or before the anniversary of approval and on completion of the project.
- You must report as soon as practicable anything that might warrant review of ethical approval of the project including:
  - Serious or unexpected adverse events (which should be reported within 72 hours).
  - Unforeseen events that might affect continued ethical acceptability of the project.
- Any changes to the proposal must be approved prior to their implementation (except where an amendment is undertaken to eliminate *immediate* risk to participants).
- Personnel working on this project must be sufficiently qualified by education, training and experience for their role, or adequately supervised. Changes to personnel must be reported and approved.

Research Integrity & Ethics Administration
Research Portfolio
Level 3, F23 Administration Building
The University of Sydney
NSW 2006 Australia

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ABN 15 211 513 464
CRICOS 00026A

THE UNIVERSITY OF SYDNEY

- Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, as relevant to this project.
- Data and primary materials must be retained and stored in accordance with the relevant legislation and University guidelines.
- Ethics approval is dependent upon ongoing compliance of the research with the *National Statement on Ethical Conduct in Human Research*, the *Australian Code for the Responsible Conduct of Research*, applicable legal requirements, and with University policies, procedures and governance requirements.
- The Ethics Office may conduct audits on approved projects.
- The Chief Investigator has ultimate responsibility for the conduct of the research and is responsible for ensuring all others involved will conduct the research in accordance with the above.

This letter constitutes ethical approval only.

Please contact the Ethics Office should you require further information or clarification.

Sincerely,



Associate Professor Haryana Dhillon
Chair
Human Research Ethics Committee (HREC 3)

The University of Sydney of Sydney HRECs are constituted and operate in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2018) and the NHMRC's Australian Code for the Responsible Conduct of Research (2018)

Appendix B: Permissions from the Planning and Development Agencies, Saudi Ministry of Education



المملكة العربية السعودية
وزارة التعليم
(٢٨٠)
الإدارة العامة للتعليم بالأحساء
إدارة التخطيط والتطوير
بحوث وسياسات التعليم

وزارة التعليم
Ministry of Education

الرقم: ٤٤٠٠٦٥٤٣٠٥
التاريخ: ١٤٤٤/١٠/٢٦
المرفقات:

المكرمون/جميع مدارس ومعاهد وبرامج التربية الخاصة (بنين / بنات) وفقهم الله

السلام عليكم ورحمة الله وبركاته

إلحاقاً إلى خطابنا رقم ٤٤٠٠٦٥٤٣٠٥ وتاريخ ١٤٤٤/٦/٤هـ بشأن تسهيل مهمة الباحث / خليفه سامي خليفه الدغيش، والذي يعد دراسة بحثية بعنوان "دورة المعرفة الى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية "

عليه نأمل منكم تسهيل مهمة الباحث في تطبيق أدوات الدراسة، على الفئة المستهدفة من المعلمين والمعلمات.

وتقبلوا تحياتي

[redacted]

حمد بن سعود العمر

محمد الطويل

المملكة العربية السعودية
وزارة التعليم
إدارة التعليم بمحافظة عنيزة
قسم التخطيط والتطوير

بسم الله الرحمن الرحيم
وزارة التعليم
Ministry of Education

نوع المعاملة: معاملة داخلية
رقم المعاملة: ٤٥٠٠٠٤٦٠٥٠
تاريخ المعاملة: ٢٦-١-١٤٤٥
المرفقات: لا يوجد

الموضوع: تسهيل مهمة الباحث خليفة الدغيش.

تعميم

لجميع برامج التربية الخاصة (بنين - بنات)

المكرم/ مدير مدرسة **وفقه الله**
المكرمة/ مديرة مدرسة **وفقها الله**
السلام عليكم ورحمة الله وبركاته

إشارة إلى خطاب سعادة وكيل الوزارة للتخطيط والتطوير المكلف رقم ٤٤٠٠٦٥٤٣٠٥/١ وتاريخ ١٤٤٤/١٢/٢١هـ بشأن تسهيل مهمة طالب الدكتوراه بجامعة سيدني في أستراليا/ خليفة بن سامي الدغيش في تطبيق أداتي دراسته "دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في مجال اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية"، نأمل التكرم بتسهيل مهمة الباحث في استيفاء أداتي الدراسة على الرابط ورمز الاستجابة أدناه من قبل المعلمين والمعلمات المتخصصين في مجال التوحد ومعلمي ومعلمات التخصصات الأخرى الذين يعملون بشكل مباشر مع الطلاب والطالبات ذوي اضطرابات طيف التوحد، مثمنين لكم حسن تعاونكم.

الاستبانة (١)	https://sydney.au1.qualtrics.com/jfe/form/SV_5tEKCdEYHmE4HpI	
الاستبانة (٢)	https://sydney.au1.qualtrics.com/jfe/form/SV_9HTFT6z1XX56tsa	

وتقبلوا تحياتي.

رئيس قسم التخطيط والتطوير

[redacted]

د. خالد بن محمد المنصور

- صورة لقسم التربية الخاصة (بنين - بنات).
- صورة لقسم التخطيط والتطوير.
- صورة للباحث.

المملكة العربية السعودية
وزارة التعليم
الإدارة العامة للتعليم بمنطقة تبوك
إدارة التخطيط والتطوير
البحوث والدراسات

نوع المعاملة: معاملة داخلية
رقم المعاملة: ٤٥٠٠٠٧٦٦٦٣
تاريخ المعاملة: ٢-٢-١٤٤٥
المرفقات: لا يوجد

وزارة التعليم
Ministry of Education

الموضوع : تسهيل مهمة الباحث / خليفة بن سامي الدغيش

سعادة مساعد/ـة المدير العام للشؤون التعليمية (بنين ـ بنات) وفقه/ـا الله
سعادة مدير/ـة إدارة التربية الخاصة (بنين ـ بنات) وفقه الله
سعادة مدير مكتب التعليم بمحافظة/ وفقه الله
سعادة مدير/ـة مدرسة/ وفقه/ا الله

السلام عليكم ورحمة الله وبركاته وبعد

إشارة إلى خطاب سعادة وكيل الوزارة للتخطيط والتطوير المكلف رقم ١/٠٥٤٣٠٠٦٥٤٤٠٠وتاريخ ١٤٤٤/١٢/٢٢هـ بشأن **تسهيل مهمة الباحث المبتعث / خليفة بن سامي الدغيش** والذي يقوم بدراسة بحثية بعنوان: **" دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية ".**

علماً أن عينة الدراسة المستهدفة هي معلمي ومعلمات التربية الخاصة العاملين مع ذوي اضطراب طيف التوحد بالمدارس في منطقة تبوك.

عليه نأمل منكم التكرم باستيفائها من العينة المستهدفة على الباركود أو الرابط التالي:

مقياس ممارسات التدريس
https://2u.pw/A5j8OG8

وجهات نظر المعلمين والمعلمات
https://2u.pw/7WQzWeZ

وتقبلوا تحياتي.

[redacted]
عبدالرحمن بن ناصر الناصر

المملكة العربية السعودية
وزارة التعليم
الإدارة العامة للتعليم بمحافظة جازان
إدارة التخطيط والتطوير
وحدة بحوث سياسات التعليم

وزارة التعليم
Ministry of Education

نوع المعاملة: معاملة داخلية
رقم المعاملة: ٤٤٠٠٦٥٤٣٠٥/١
تاريخ المعاملة: ٧-١-١٤٤٥
المرفقات: ٢

الموضوع: تسهيل مهمة الباحث خليفة الدغيش

المكرمـ/ـة مدير/ة مكتب التعليم **وفقهـ/ـا الله**

السلام عليكم ورحمة الله وبركاته

إشارة إلى خطاب سعادة وكيل الوزارة للتخطيط والتطوير المكلف رقم ٤٤٠٠٦٥٤٣٠٥/١ وتاريخ ٢٢/ ١٢/ ١٤٤٤هـ، المتضمن طلب تسهيل مهمة الباحث/ خليفة سامي خليفة الدغيش والذي تقوم بإعداد دراسة بحثية بعنوان: **دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية**، ولاستكمال متطلبات الدراسة سوف تقوم الباحثة بتطبيق أداة البحث (استبانة) على عينة من المعلمين والمعلمات.

عليه آمل تسهيل مهمة الباحث بتطبيق أداة الدراسة على العينة المذكورة من خلال الرابط:

https://cutt.us/zyhpQ

رابط الاستبانة (١)

https://cutt.us/NOGoN

رابط الاستبانة (٢)

وتقبلوا تحياتي وتقديري،،،

مدير إدارة التخطيط والتطوير

[redacted]

د: عصام بن محمد كريري

صورة مع التحية لسعادة المساعدين
صورة مع التحية للمشرف على مكتب المدير العام

ahakami4415

المملكة العربية السعودية
وزارة التعليم
(٢٨٠)
الإدارة العامة للتعليم بمنطقة مكة المكرمة
إدارة التخطيط والتطوير

وزارة التعليم
Ministry of Education

الرقم: ٤٥٠٠١٩٧٦١٠
التاريخ: ١٤٤٥/٢/٢٢
المرفقات:

((نموذج الكتروني للبحث والدراسات في العالم الرقمي))

تعميم إلى مدارس التعليم العام (بنين-بنات) برامج التربية الخاصة

المكرم/ة مدير/ة المدرسة **وفقه/ـا الله**

السلام عليكم ورحمة الله وبركاته، وبعد:

إشارة إلى خطاب وكيل الوزارة للتخطيط والتطوير المكلف برقم ٤٤٠٠٦٥٤٣٠٥/١ وتاريخ ١٤٤٤/١٢/٢١

بشأن طلب الباحث:

خليفه سامي خليفه الدغيش، والذي يرغب في تطبيق أداة دراسته العلمية وذلك استكمالا الحصول على الدكتوراه وفق البيانات أدناه:

عنوان الدراسة	دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في مجال اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية		
عينة الدراسة	المعلمين والمعلمات/ العاملين مع ذوي اضطرابات طيف التوحد		
أداة الدراسة	مقياس		
الرابط الالكتروني للأداة	https://medu.edu.sa/api/geturl/prospector/1101	باركود	
بريد الكتروني	uni.sydney.edu.au@kald٦٩٣٧	الجوال	٩٦٦٥٣٦٦٩٩١٥٠

عليه نأمل توجيه من يلزم من منسوبيكم بتسهيل مهمة الباحث وذلك عن طريق الدخول على الرابط أو الباركود الالكتروني أعلاه، شاكرين لكم حسن تعاونكم في خدمة البحث العلمي.

وتقبلوا تحياتي وتقديري ،،،

المدير العام للتعليم بمنطقة مكة

[redacted]

محمد بن أحمد المدخلي

المملكة العربية السعودية
وزارة التعليم
إدارة التخطيط والتطوير

وزارة التعليم
Ministry of Education

الرقم : ٤٤٠٠٦٥٤٣٠٥/١
التاريخ: ١٧-٨-٢٠٢٣
المشفوعات:

المكرم رئيس / ـة قسم التربية الخاصة **حفظه / ها اللّه**

المكرم مدير / ة المدرسة **حفظه / ها اللّه**

السلام عليكم ورحمة الله وبركاته

بناء على توجيه سعادة مدير التعليم المبني على خطاب سعادة مديرعام التعليم بمحافظة الإحساء المتضمن تسهيل مهمة المبتعث / خليفه بن سامي خليفه الدغيش والذي يقوم بدراسة علمية بعنوان " دورة المعرفة إلى العمل : التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية " الأمر الذي يستلزم تطبيق الاستبانة على المعلمين والمعلمات العاملين مع ذوي اضطرابات طيف التوحد / مدارس ومراكز والفصول الملحقة للتربية الخاصة

وتقبلوا فائق التحية والتقدير ، ، ،

إدارة التخطيط والتطوير

[redacted]

نادية بنت مطلق الروقي

المملكة العربية السعودية
وزارة التعليم
الإدارة العامة للتعليم بمحافظة جازان
إدارة التخطيط والتطوير
وحدة بحوث سياسات التعليم

وزارة التعليم
Ministry of Education

نوع المعاملة: معاملة داخلية
رقم المعاملة: ٤٤٠٠٦٥٤٣٠٥/١
تاريخ المعاملة: ٧-١-١٤٤٥
المرفقات: ٢

الموضوع: تسهيل مهمة الباحث خليفة الدغيش

المكرمـ/ـة مدير/ة مكتب التعليم **وفقهـ/ـا الله**

السلام عليكم ورحمة الله وبركاته

إشارة إلى خطاب سعادة وكيل الوزارة للتخطيط والتطوير المكلف رقم ٤٤٠٠٦٥٤٣٠٥/١ وتاريخ ٢٢/ ١٢/ ١٤٤٤هـ، المتضمن طلب تسهيل مهمة الباحث/ خليفة سامي خليفة الدغيش والذي تقوم بإعداد دراسة بحثية بعنوان: **دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية**، ولاستكمال متطلبات الدراسة سوف تقوم الباحثة بتطبيق أداة البحث (استبانة) على عينة من المعلمين والمعلمات.

عليه آمل تسهيل مهمة الباحث بتطبيق أداة الدراسة على العينة المذكورة من خلال الرابط:

https://cutt.us/zyhpQ

رابط الاستبانة (١)

https://cutt.us/NOGoN

رابط الاستبانة (٢)

وتقبلوا تحياتي وتقديري،،،

مدير إدارة التخطيط والتطوير

[redacted]

د: عصام بن محمد كريري

صورة مع التحية لسعادة المساعدين
صورة مع التحية للمشرف على مكتب المدير العام

المملكة العربية السعودية
وزارة التعليم
إدارة التعليم بمحافظة جدة
التخطيط والمعلومات

وزارة التعليم
Ministry of Education

الرقم : ٤٥٠٠٠٦٤٣٧٦
التاريخ: ١٤٤٥/١/٢٩
المشفوعات:

الموضوع: بشأن تسهيل مهمة الباحث / خليفة الدغيش

المكرم / ـــــة : مدير / ة إدارة التربية الخاصة وفقه/ ـــا الله

السلام عليكم ورحمة الله وبركاته

"تسهيل مهمة بحث "

الاسم	خليفه سامي الدغيش	السجل المدني	١٠٧٩٠٧٤٣٤٨
الجوال	٠٥٣٦٦٩٩١٥٠	البريد الإلكتروني	kald٦٩٣٧@uni.sydney.edu.au
الجهة المشرفة	جامعة سيدني	التخصص	اضطرابات طيف التوحد
الدرجة العلمية	دكتوراه	عينة البحث	المعلمين والمعلمات العاملين مع ذوي اضطرابات طيف التوحد ضمن برامج التربية الخاصة بوزارة التعليم
عنوان البحث	دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في مجال اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية		

بناءً على خطاب القائم باعمال الملحقية الثقافية بسفارة المملكة العربية السعودية لدى أستراليا، حول تسهيل مهمة الباحث الموضحة بياناته أعلاه، عليه نأمل منكم تسهيل مهمته بتطبيق أداة بحثه على عينة الدراسة من خلال رمز الاستجابة السريع (QR) أدناه، وفق اللوائح المنظمة.كما نود التنويه بأن الباحث يتحمل مسؤولية جمع البيانات والحفاظ على سريتها لاستخدامها لأغراض البحث العلمي فقط.

الاستبانة رقم (١)

الاستبانة رقم (٢)

وتقبلوا تحياتنا وتقديرنا ، ، ،

مدير إدارة التخطيط والمعلومات

[redacted]

أحمد بن محمد الشهري

رقم المعاملة: ٤٥٠٠٠٤٧٦٧٠ تاريخ الإحالة: ١٤٤٥-١-٢٦

المملكة العربية السعودية
وزارة التعليم
(٢٨٠)
الإدارة العامة للتعليم بالمنطقة الشرقية
إدارة التخطيط والتطوير
PD

وزارة التعليم
Ministry of Education

الرقم :
التاريخ :
المرفقات :

الرؤية: الريادة لبناء جيل مبدع	**الرسالة:** تقديم خدمات تربوية وتعليمية ذات جودة عالية وفق معايير عالمية بمشاركة مجتمعية	**القيم:** المواطنة-الإتقان-العدل-العمل بروح الفريق-التنمية الذاتية-المسؤولية الاجتماعية

الموضوع: تسهيل مهمة الباحث خليفة الدغيش

المكرمون / مديرو ومديرات مكاتب التعليم **وفقهم الله**

السلام عليكم ورحمة الله وبركاته

بناءً على إحالة سعادة المدير العام رقم ٤٤٠٠٦٥٤٣٠٥ وتاريخ ٢١ ذو الحجة ١٤٤٤هـ والمبنية على خطاب وكيل الوزارة للتخطيط والتطوير المكلف.

آمل منكم التكرم بتسهيل مهمة الباحث/ خليفة بن سامي الدغيش طالب الدراسات العليا لدرجة الدكتوراه بجامعة(The University of Sydney) بأستراليا، والذي يقوم بإعداد بحث بعنوان " دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية " حيث تتطلب الدراسة استيفاء عدد (٢) استبانة من قبل المعلمين والمعلمات العاملين مع ذوي اضطرابات طيف التوحد ضمن برامج التربية الخاصة بوزارة التعليم على الرابط أوQR-Code التالي:

الاستبانة ١	الاستبانة ٢
https://cutt.us/nyZPg	https://cutt.us/G8w6F

شاكرين لكم تسهيل مهمته وفق اللوائح والأنظمة المنظمة لذلك.

والله ولي التوفيق

مديرة إدارة التخطيط والتطوير

١٤٤٥/١/٢٦هـ

غزيل بنت عبد المحسن العتيبي

ب/ آل كداش
١٤٤٥/١/٢٦هـ

Appendix C: Invitation Email

Subject: Invitation to Participate: Research Study on Autism Education

Dear [Name of School] Administration,

I hope this email finds you well. I am a research student at the University of Sydney. My research study involves a combination of surveys and focus group discussions to investigate teachers' knowledge and use of various autism teaching practices and identify factors that support and motivate teachers to integrate evidence-based practices in their classrooms.

This research study has received approval from the Human Research Ethics Committee of The University of Sydney [HREC Approval No. Once obtained] and reviewed and approved by the Agency for Development and Planning under the Ministry of Education in Saudi Arabia. Please see the attached approval letters and the participant information statement for further information.

Your school is invited to participate in the research study because of its emphasis on providing high-quality education for students with an autism spectrum disorder. It is important to consider that teachers' participation in the research is entirely voluntary, and they will not face any adverse effects if they choose to withdraw from the study at any point. Your contribution to this research would be much valued and greatly beneficial to autism education. The results of this study will likely have far-reaching effects on how autistic people are taught and cared for.

If you are interested in gaining further insight into the study, I would like to request the opportunity to visit your school or arrange a remote meeting to answer any questions or concerns the teachers or school administration may have. The visit or remote meeting is exclusive to discussing the study and exploring the possibility of participation and does not imply any commitment or obligation to participate. Thank you for taking the time to read this. I am looking forwards to hearing from you.

Khalifah Aldughaysh
Ph.D. Student, University of Sydney
Lecturer, Imam Abdulrahman bin Faisal University, Dammam
@ kald6937@uni.sydney.edu.au
✆ +966551703854



Appendix D: Participant Information Statement – Survey

THE UNIVERSITY OF SYDNEY

Research Study: Knowledge to Action Cycle: Strategic Planning to Transform Effective Autism Intervention into Sustained Practice Among Saudi Arabian Teachers

Dr Jessica Zanuttini (Responsible Researcher)
Faculty of Arts and Social Sciences, Sydney School of Education and Social Work
Phone: +61 2 9351 7029| Email: jessica.zanuttini@sydney.edu.au
Mr. Khalifah Aldughaysh (PhD student) Email: kald6937@uni.sydney.edu.au

1. What is this study about?

We are conducting a research study about critical factors that influence the implementation of evidence-based practices (EBPs) in autism schools in Saudi Arabia. The purpose of this research survey is to gather information from teachers regarding their knowledge and use of various autism interventions. By rating their own knowledge and use of different autism interventions, teachers can help us identify which practices are used most frequently and which are used least, and how these practices relate to demographic characteristics. The findings of this study may eventually contribute to improving the quality of support that teachers provide to students with autism.

Please read this sheet carefully and ask questions about anything that you don't understand or want to know more about.

2. Who is running the study?

The study is being carried out by the following researchers:

- Khalifah Aldughaysh is conducting this study as the basis for the degree of Doctor of Philosophy (Art and Social Science) at The University of Sydney.

Lead supervisor

- Dr Jessica Zanuttini, Lecturer of Special and Inclusive Education, Sydney School of Education and Social Work, Faculty of Arts and Social Sciences, University of Sydney

Supervisor

- Dr Cathy Little, Senior Lecturer of Special and Inclusive Education, Sydney School of Education and Social Work, Faculty of Arts and Social Sciences, University of Sydney

3. Who can take part in the study?

We are seeking to recruit female and male teachers in Saudi Arabian schools who specialise in autism or a comparable discipline and also work directly with autistic students. You have been invited to participate in this study because you work at a school that falls under the supervision of the Ministry of Education.

4. What will the study involve for me?

If you decide to take part in this study, you will be asked to complete one online survey, which will be accessible through a link or barcode provided by the school administration. This survey is a self-rating assessment of your knowledge and use of different interventions used to support

individuals with autism. The survey will take approximately 20 minutes to complete and can be completed at your convenience.

5. Can I withdraw once I've started?

Being in this study is completely voluntary and you do not have to take part.

Your decision will not affect your current or future relationship with the researchers or anyone else at The University of Sydney.

We do not anticipate your decision will affect your relationship with any of the other institutions and associations that our research team are affiliated with.

Your survey submission implies consent to participate, and access to the survey will be allowed after clicking the consent question box.

Due to the anonymity of the survey, you may withdraw your responses before to submission; however, once submitted, they cannot be identified or removed.

6. Are there any risks or costs?

Aside from giving up your time, we do not expect that there will be any risks or costs associated with taking part in this study.

7. Are there any benefits?

You will not receive any direct benefits from being in the study.

8. What will happen to information that is collected?

By providing your consent, you are agreeing to us collecting information about you for the purposes of this study.

Any information you provide us will be stored securely and we will only disclose identifiable information with your permission unless we are required by law to release information. We intend to make the results of this study available through two mediums: a thesis and a journal article.

9. Will I be told the results of the study?

You have a right to receive feedback about the general findings of this survey. In case you have any questions or would like to receive a written summary or discuss the study's feedback and findings, you may reach out to the research student by sending an email to kald6937@uni.sydney.edu.au. This feedback will be in the form of a brief lay summary.

10. What if I would like further information?

When you have read this information, the following researcher will be available to discuss it with you further and answer any questions you may have:

- Mr. Khalifah Aldughaysh (PhD student) School of Education and Social Work, University of Sydney, Email: kald6937@uni.sydney.edu.au

11. What if I have a complaint or any concerns?

The ethical aspects of this study have been approved by the Human Research Ethics Committee (HREC) of The University of Sydney [HREC Approval No. 2023/174] according to the *National Statement on Ethical Conduct in Human Research (2007).*

If you are experiencing emotional discomfort as a result of participating in this study, please feel free to reach out to any of the following organizations for counselling assistance and support. Note that they offer free psychological and mental counselling that is monitored by qualified staff and available around the clock.

The National Center for Mental Health Promotion
920033360

Mental Health Hospital- Al-Ahsa
013 575 1111

If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the University:

Human Ethics Manager
human.ethics@sydney.edu.au
+61 2 8627 8176

Ministry of Education - Saudi Arabia
Department of Education- Al-Hasa
Planning and Development Director
edu11@hasaedu.info
013 581 5064

This information sheet is for you to keep

Appendix E: Participant Information Statement – Focus Group Discussions

THE UNIVERSITY OF SYDNEY

Research Study: Knowledge to Action Cycle: Strategic Planning to Transform Effective Autism Intervention into Sustained Practice Among Saudi Arabian Teachers

Dr Jessica Zanuttini (Responsible Researcher)
Faculty of Arts and Social Sciences, Sydney School of Education and Social Work
Phone: +61 2 9351 7029| Email: jessica.zanuttini@sydney.edu.au
Mr. Khalifah Aldughaysh (PhD student) Email: kald6937@uni.sydney.edu.au

1. What is this study about?

We are conducting a research study to investigate critical factors that influence the implementation of evidence-based practices (EBPs) in autism schools in Saudi Arabia. The purpose of this research is to involve the teachers and empower them to play a key role in identifying their most pressing needs, as well as identifying the key contextual barriers that hinder the implementation of EBPs and potential solutions to overcome these barriers.

Please read this sheet carefully and ask questions about anything that you don't understand or want to know more about.

2. Who is running the study?

The study is being carried out by the following researchers:

- Khalifah Aldughaysh is conducting this study as the basis for the degree of Doctor of Philosophy (Art and Social Science) at The University of Sydney.

Lead supervisor

- Dr Jessica Zanuttini, Lecturer of Special and Inclusive Education, Sydney School of Education and Social Work, Faculty of Arts and Social Sciences, University of Sydney

Supervisor

- Dr Cathy Little, Senior Lecturer of Special and Inclusive Education, Sydney School of Education and Social Work, Faculty of Arts and Social Sciences, University of Sydney

3. Who can take part in the study?

We are seeking to recruit female and male teachers in Saudi Arabian schools who specialise in autism or a comparable discipline and also work directly with autistic students. You have been invited to participate in this study because you work at a school that falls under the supervision of the Ministry of Education.

4. What will the study involve for me?

If you decide to participate in this study, you will be asked to participate in three focus group meetings, each lasting for an hour, and all meetings will be audio and/or video recorded. These meetings can be held either in person at your school or online using Zoom, depending on what is most convenient for you. The focus group will consist of a small group of your colleagues, with a total number of attendees not exceeding eight. During these meetings, we will discuss the factors that both facilitate and impede the implementation of EBPs in autism schools.

5. Can I withdraw once I've started?

Being in this study is completely voluntary and you do not have to take part.

Your decision will not affect your current or future relationship with the researchers or anyone else at The University of Sydney.

We do not anticipate your decision will affect your relationship with any of the other institutions and associations that our research team are affiliated with.

If you decide to take part in the study and then change your mind you can withdraw by emailing the researcher via kald6937@uni.sydney.edu.au. Your participation in the study is completely voluntary, and you will suffer no consequences if you decide to withdraw at any time.

If you take part in a focus group, you are free to stop and leave at any time during the meeting or to refuse to answer any of the questions.

It is important to note that, since the discussion is a group activity, it may not be feasible to remove your individual comments from the record once the session has concluded. However, you are entitled to request that the researcher exclude any of your recorded responses completely from the study.

If you choose to withdraw, we will not collect any more information from you. Please let us know at the time you withdraw what you would like us to do with information we have collected about you up to that point.

6. Are there any risks or costs?

Aside from giving up your time, we do not expect that there will be any risks or costs associated with taking part in this study.

7. Are there any benefits?

You will not receive any direct benefits from being in the study.

8. What will happen to information that is collected?

By providing your consent, you are agreeing to us collecting information about you for the purposes of this study.

Any information you provide us will be stored securely and we will only disclose identifiable information with your permission unless we are required by law to release information. We intend to make the results of this study available through two mediums: a thesis and a journal article. You will not be individually identifiable in these publications.

9. Will I be told the results of the study?

You have a right to receive feedback about the overall results of this study. By checking the box on the Participant Consent Form, you may express your desire to receive a written summary of the study findings. In case you have any questions or would want to discuss the study's feedback

and findings, you may reach out to the researcher by sending an email to kald6937@uni.sydney.edu.au. This feedback will be in the form of a brief lay summary.

10. What if I would like further information?

When you have read this information, the following researcher will be available to discuss it with you further and answer any questions you may have:

- Khalifah Aldughaysh (PhD student) School of Education and Social Work, University of Sydney, Email: kald6937@uni.sydney.edu.au

11. What if I have a complaint or any concerns?

The ethical aspects of this study have been approved by the Human Research Ethics Committee (HREC) of The University of Sydney [HREC Approval No. 2023/174] according to the *National Statement on Ethical Conduct in Human Research (2007).*

If you are experiencing emotional discomfort as a result of participating in this study, please feel free to reach out to any of the following organizations for counselling assistance and support. Note that they offer free psychological and mental counselling that is monitored by qualified staff and available around the clock.

The National Center for Mental Health Promotion
920033360

Mental Health Hospital- Al-Ahsa
013 575 1111

If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the University:

Human Ethics Manager
human.ethics@sydney.edu.au
+61 2 8627 8176

Ministry of Education - Saudi Arabia
Department of Education- Al-Hasa
Planning and Development Director
edu11@hasaedu.info
013 581 5064

This information sheet is for you to keep

Appendix F: Participant Consent Form – Focus Group Discussions

Participant Consent Form

THE UNIVERSITY OF SYDNEY

Research Study: Knowledge to Action Cycle: Strategic Planning to Transform Effective Autism Intervention into Sustained Practice Among Saudi Arabian Teachers

Dr Jessica Zanuttini (Responsible Researcher)
Faculty of Arts and Social Sciences, Sydney School of Education and Social Work
Phone: +61 2 9351 7029| Email: jessica.zanuttini@sydney.edu.au
Mr. Khalifah Aldughaysh (PhD student) Email: kald6937@uni.sydney.edu.au

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Participant Name _____

I agree to take part in this research study. In giving my consent, I confirm that that:

- The details of my involvement have been explained to me, and I have been provided with a written Participant Information Statement to keep.
- I understand the purpose of the study is to investigate factors that influence the implementation of evidence-based practices (EBPs) in autism schools in Saudi Arabia.
- I acknowledge that the risks and benefits of participating in this study have been explained to me to my satisfaction.
- I understand that in this study, I will be required to participate in three focus group meetings, with each meeting lasting for an hour to discuss the key contextual barriers that hinder the implementation of EBPs and potential solutions to overcome these barriers.
- I understand that my participation may be audio and/or videotaped.
- I understand that being in this study is completely voluntary.
- I am assured that my decision to participate will not have any impact on my relationship with the research team or the University of Sydney.
- I understand that I am free to withdraw from this study at any time and that I can choose to withdraw any information I have already provided (unless the data has already been de-identified or published).
- I understand that this discussion is a group activity, it may not be feasible to remove my individual comments from the record once the session has concluded. However, I am entitled to request that the researcher exclude any of my recorded responses completely from the study.
- I understand that this discussion is a group activity, and I am obligated to maintain the confidentiality of any information discussed by participants and researchers throughout the focus group session.

- I have been informed that the confidentiality of the information I provide will be protected and will only be used for purposes that I have agreed to. I understand that information identifying me will only be told to others with my permission, except as required by law.

- I understand that the results of this study may be published, and that publications will not contain my name or any identifiable information about me.

- I confirm the following:

  I consent to recordings (audio and video) Yes ☐ No ☐

  I would like feedback on the overall results of this study Yes ☐ No ☐

  If you answered **yes**, please provide your preferred contact details (email/telephone/postal address):

  _____

  _____

  _____

  _____

- I understand that after I sign and return this consent form it will be retained by the researcher, and that I may request a copy at any time.

Participant Name _____

Signature _____

Date _____

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مشهد

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المعاني المتخصصة للترجمة المعتمدة

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Participant Information Statement- Survey 1: Autism Intervention Practices Scale

بيان/ نموذج معلومات المشارك

دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في مجال اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية

د. جسيكا زاناتيني (مشرف/ مسؤول البحث)
كلية الآداب والعلوم الاجتماعية، كلية التربية والخدمة الاجتماعية بجامعة سيدني
هاتف: 61293517029+
البريد الالكتروني: jessica.zanuttini@sydney.edu.au
الاستاذ: خليفه الدغيش (طالب دكتوراه)
البريد الالكتروني: kald6937@uni.sydney.edu.au

ماذا تشمل هذه الدراسة؟

هذه الدراسة البحثية تهدف الى تحديد العوامل الحاسمة والتي تؤثر على تنفيذ الممارسات القائمة على الأدلة في مدارس ذوي اضطرابات طيف التوحد في المملكة العربية السعودية. هذه الاستبانة بالتحديد تركز على جمع المعلومات من المعلمين والمعلمات فيما يتعلق بمجموعة مختلفة من الممارسات التربوية بحيث يقوم كل مشارك بتقييم مدى معرفته واستخدمه لتلك الممارسات. يمكن للمشاركين في هذه الاستبانة مساعدتنا لتسليط الضوء على الممارسات الأكثر والأقل استخدما وكيف ترتبط نتائج هذا التقييم الذاتي على الخصائص الديموغرافية المختلفة. نأمل ان تساهم النتائج المستقبلية لهذه الدراسة في تحسين جودة الدعم الذي يقدمه المعلمون والمعلمات للطلاب من ذوي اضطرابات طيف التوحد.

يرجى الاطلاع على المعلومات الواردة في هذا النموذج بعناية ولا تتردد في تقديم تساؤلاتك فيما يخص أي جزئية غير واضحة او في حالة كان لديك رغبة في معرفة المزيد عن الدراسة.

من الذي يجري هذه الدراسة؟

يتم اجراء هذه الدراسة من قبل الباحثين التالية أسماؤهم:

- يقوم الاستاذ خليفه الدغيش بتنفيذ هذه الدراسة البحثية للحصول على درجة الدكتوراه في الفلسفة من جامعة سيدني/ كلية الآداب والعلوم الاجتماعية/ كلية التربية والخدمة الاجتماعية.
- د. جسيكا زاناتيني، محاضرة في قسم التربية الخاصة والتعليم الشامل، كلية الآداب والعلوم الاجتماعية، كلية التربية والخدمة الاجتماعية بجامعة سيدني.
- د. كاثي ليتل، محاضرة اولى في قسم التربية الخاصة والتعليم الشامل، كلية الآداب والعلوم الاجتماعية، كلية التربية والخدمة الاجتماعية بجامعة سيدني.

من يمكنه المشاركة في هذه الدراسة؟

نحن نسعى لتجنيد المعلمين والمعلمات في مدارس المملكة العربية السعودية المتخصصين في مجال التوحد أو في تخصصات أخرى مرتبطة وأيضًا يعملون بشكل مباشر مع الطلاب من ذوي اضطرابات طيف التوحد. لقد تمت دعوتك للمشاركة في هذه الدراسة لأنك تعمل في مؤسسة تعليمية ضمن إشراف وزارة التعليم.

ماذا سيكون دوري في هذا الباحث؟

إذا قررت المشاركة في هذه الدراسة، فسيُطلب منك إكمال استبيان واحد فقط عبر الإنترنت، والذي يمكن الوصول إليه من خلال رابط أو باركود سوف توفره إدارة المدرسة لجميع المعلمين. هذا الاستطلاع هو تقييم ذاتي لمعرفتك واستخدامك لمجموعة من الممارسات التدريسية المستخدمة لدعم الطلاب من ذوي اضطراب طيف التوحد. تعبئة الاستبانة ربما يستغرق حوالي 20 دقيقة من وقتك ويمكنك إكمال الاستبانة في أي وقت مناسب لك.

هل يمكنني الانسحاب من المشاركة في الاستبانة بمجرد البدء؟

- تعتبر مشاركتك في هذه الدراسة امر تطوعي بشكل كامل ولا يوجد ما يستوجب المشاركة.

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Participant Information Statement- Survey 1: Autism Intervention Practices Scale

- قرارك بعدم المشاركة في هذه الدراسة لن يؤثر على علاقتك الحالية او المستقبلية بالباحثين او اي شخص آخر بجامعة سيدني
- لا نتوقع أيضا عدم مشاركتك في هذه الدراسة ان يؤثر على علاقتك بالمؤسسات والجمعيات الأخرى التي ربما ينتمي إليها الفريق البحثي.
- إكمال وإرسال الاستبانة الخاص بك يدل على موافقتك على المشاركة، وسيتم السماح لك بالوصول إلى الاستبانة بعد النقر على مربع سؤال الموافقة على المشاركة.
- يمكنك الانسحاب من الاستبانة قبل إرسالها، ولكن بمجرد إرسالها، لا يمكن للباحث تحديدها أو إزالتها نظرًا لعدم القدرة على الكشف عن هويتك.

هل هناك اي مخاطر او تكاليف مرتبطة بمشاركتك في هذه الدراسة؟

لا نتوقع أنه ستكون هناك أي مخاطر أو تكاليف مرتبطة بالمشاركة في هذه الدراسة ماعدا تكلفة التخلي عن وقتك.

هل هناك فوائد من المشاركة في هذه الدراسة؟

لن تحصل على أي فوائد مباشرة من مشاركتك في الدراسة.

ماذا سيحدث للمعلومات التي سوف يتم جمعها من المشاركين في هذه الدراسة؟

إذا منحتنا إذنًا لجمع المعلومات، فسنستخدمها فقط لأغراض البحث والدراسة.

سيتم تخزين المعلومات والبيانات التي تقدم لنا من خلال المشاركين بشكل آمن. وسنشارك فقط المعلومات التي يمكن استخدامها للعثور عليك بعد الحصول على اذن من المشاركين أو في حال كان هناك جهة قانونية تحتم علينا مشاركة البيانات المجمعة. كما نخطط لنشر نتائج هذه الدراسة من خلال أطروحة الدكتوراه ومقال في مجلة علمية.

هل سيتم تزويدي بنتائج الدراسة؟

لديك الحق في تلقي ملاحظات حول النتائج العامة لهذا الدراسة. في حال كان لديك أي استفسار أو ترغب في الحصول على ملخص مكتوب أو مناقشة ملاحظات الدراسة ونتائجها، يمكنك التواصل مع الباحث عن طريق إرسال بريد إلكتروني إلى kald6937@uni.sydney.edu.au. سوف يتم تقديم نتائج هذا الاستطلاع من خلال ملخص موجز للمشاركين في الدراسة.

ماذا لو ارغب في المزيد من المعلومات؟

عندما تقرأ هذه المعلومات (ملخص النتائج)، سيكون الباحث متاحًا لمناقشتها معك أكثر والإجابة على أي أسئلة قد تتبادر الى ذهنك.

- الاستاذ خليفه الدغيش (طالب دكتوراه) بجامعة سيدني/ كلية الآداب والعلوم الاجتماعية - كلية التربية والخدمة الاجتماعية.
البريد الإلكتروني: kald6937@uni.sydney.edu.au

ماذا لو كان لدي شكوى او أي مخاوف؟

تمت مراجعة هذه الدراسة والموافقة على الجوانب الأخلاقية من قبل لجنة اخلاقيات البحوث البشرية بجامعة سيدني [رقم موافقة لجنة اخلاقيات البحث: ٢٠٢٣/١٧٤] وذلك وفقاً للبيان الوطني للسلوك الأخلاقي في البحوث البشرية (٢٠٠٧).

في حال كنت تعاني من عدم ارتياح او قلق نتيجة للمشاركة في هذه الدراسة، فلا تتردد في التواصل مع أي من الجهات التالية لتقديم المشورة والمساعدة والدعم النفسي. هذه الجهات تقدم استشارات نفسية مجانية يتم مراقبتها من قبل موظفين مؤهلين ومتوفرة على مدار الساعة.

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Participant Information Statement- Survey 1: Autism Intervention Practices Scale

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إذا كان لديك قلق بشأن الطريقة التي أجريت بها هذه الدراسة او كنت تريد تقديم شكوى إلى شخص مستقل عن الدراسة فيرجى الاتصال بالجامعة:

مدير بحث الاخلاقيات البشرية

human.ethics@sydney.edu.au
+61 2 8627 8176

وزارة التعليم بالمملكة العربية السعودية

إدارة التعليم بمنطقة الاحساء

مدير التخطيط والتطوير

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013 581 5064

نموذج المعلومات هذه لك للاحتفاظ بها

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بيان/ نموذج معلومات المشارك

دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في مجال اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية

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الاستاذ: خليفه الدغيش (طالب دكتوراه)
البريد الالكتروني: kald6937@uni.sydney.edu.au

ماذا تشمل هذه الدراسة؟

هذه الدراسة البحثية تهدف الى تحديد العوامل الحاسمة والتي تؤثر على تنفيذ الممارسات القائمة على الأدلة في مدارس ذوي اضطرابات طيف التوحد في المملكة العربية السعودية. تم تصميم جلسات التركيز خصيصًا لإشراك المعلمين والمعلمات وتمكينهم من لعب دور رئيسي في تحديد احتياجاتهم الأكثر إلحاحًا، وكذلك تحديد الحواجز السياقية الرئيسية التي تعيق الاستفادة من الممارسات القائمة على الأدلة واقتراح الحلول الممكنة للتغلب على هذه الحواجز.

يرجى الاطلاع على المعلومات الواردة في هذا النموذج بعناية ولا تتردد في تقديم تساؤلاتك فيما يخص أي جزئية غير واضحة او في حالة كان لديك رغبة في معرفة المزيد عن الدراسة.

من الذي يجري هذه الدراسة؟

يتم اجراء هذه الدراسة من قبل الباحثين التالية أسماؤهم:

- يقوم الاستاذ خليفه الدغيش بتنفيذ هذه الدراسة البحثية للحصول على درجة الدكتوراه في الفلسفة من جامعة سيدني/ كلية الآداب والعلوم الاجتماعية/ كلية التربية والخدمة الاجتماعية.
- د. جسيكا زاناتيني، محاضرة في قسم التربية الخاصة والتعليم الشامل، كلية الآداب والعلوم الاجتماعية، كلية التربية والخدمة الاجتماعية بجامعة سيدني.
- د. كاثي ليتل، محاضرة اولى في قسم التربية الخاصة والتعليم الشامل، كلية الآداب والعلوم الاجتماعية، كلية التربية والخدمة الاجتماعية بجامعة سيدني.

من يمكنه المشاركة في هذه الدراسة؟

نحن نسعى لتجنيد المعلمين والمعلمات في مدارس المملكة العربية السعودية المتخصصين في مجال التوحد أو في تخصصات أخرى مرتبطة وأيضًا يعملون بشكل مباشر مع الطلاب من ذوي اضطرابات طيف التوحد. لقد تمت دعوتك للمشاركة في هذه الدراسة لأنك تعمل في مؤسسة تعليمية ضمن إشراف وزارة التعليم.

ماذا سيكون دوري في هذا الباحث؟

إذا قررت المشاركة في هذه الدراسة، فسيُطلب منك الحضور ومشاركة رأيك في ثلاث اجتماعات منفصلة، كل اجتماع سوف يستمر لمدة ساعة، وسوف يتم تسجيل جميع الاجتماعات (صوتي و/ او فيديو). يمكن عقد جلسات النقاش بشكل حضوري او عن بعد باستخدام برنامج ZOOM ويمكنك اختيار طريقة الحضور التي تتلاءم مع ظروفك الخاصة. ستتألف مجموعات النقاش المركزة من مجموعة صغيرة لا تتعدى ثمانية اشخاص من زملائك في المدرسة. خلال هذه الاجتماعات سوف نناقش العوامل التي تعيق او تسهل استخدام الممارسات القائمة على الأدلة في مدارس ذوي اضطراب التوحد.

هل يمكنني الانسحاب من المشاركة في الاستبانة بمجرد البدء؟

- تعتبر مشاركتك في هذه الدراسة امر تطوعي بشكل كامل ولا يوجد ما يستوجب المشاركة.
- قرارك بعدم المشاركة في هذه الدراسة لن يؤثر على علاقتك الحالية او المستقبلية بالباحثين او اي شخص آخر بجامعة سيدني

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- لا نتوقع أيضا عدم مشاركتك في هذه الدراسة ان يؤثر على علاقتك بالمؤسسات والجمعيات الأخرى التي ربما ينتمي إليها الفريق البحثي.
- إذا قررت المشاركة في هذه الدراسة ثم غيرت رأيك فإنه يمكنك الانسحاب عن طريق التواصل مع الباحث عبر البريد الالكتروني kald6937@uni.sydney.edu.au. مشاركتك تطوعية تماماً ولن تتحمل اي عواقب إذا قررت الانسحاب في اي وقت.
- إذا قمت بالمشاركة في مجموعات النقاش فلديك الحرية المطلقة في التوقف والمغادرة في أي وقت أثناء الاجتماع أو رفض الإجابة على أي من الأسئلة المطروحة من الباحث.
- من المهم أن تلاحظ أنه نظرًا لأن المناقشة نشاط جماعي، فقد لا يكون من الممكن إزالة تعليقاتك الفردية من التسجيلات بمجرد انتهاء الجلسة. ومع ذلك فإنه يحق لك أن تطلب من الباحث استبعاد أي من ردودك المسجلة بالكامل من الدراسة.
- إذا قررت الانسحاب، فلن نجمع المزيد من المعلومات منك. كما يمكنك ان تقرر في الوقت الذي تنسحب فيه ما تريد أن نفعله بالمعلومات التي جمعناها عنك حتى هذه النقطة.

هل هناك اي مخاطر او تكاليف مرتبطة بمشاركتك في هذه الدراسة؟

لا نتوقع أنه ستكون هناك أي مخاطر أو تكاليف مرتبطة بالمشاركة في هذه الدراسة ماعدا تكلفة التخلي عن وقتك.

هل هناك فوائد من المشاركة في هذه الدراسة؟

لن تحصل على أي فوائد مباشرة من مشاركتك في الدراسة.

ماذا سيحدث للمعلومات التي سوف يتم جمعها من المشاركين في هذه الدراسة؟

إذا منحتنا إذنًا لجمع المعلومات، فسنستخدمها فقط لأغراض البحث والدراسة.

سيتم تخزين المعلومات والبيانات التي تقدم لنا من خلال المشاركين بشكل آمن. وسنشارك فقط المعلومات التي يمكن استخدامها للعثور عليك بعد الحصول على اذن من المشاركين أو في حال كان هناك جهة قانونية تحتم علينا مشاركة البيانات المجمعة. كما نخطط لنشر نتائج هذه الدراسة من خلال أطروحة الدكتوراه ومقال في مجلة علمية.

هل سيتم تزويدي بنتائج الدراسة؟

لديك الحق في تلقي ملاحظات حول النتائج العامة لهذا الدراسة. في حال كان لديك أي استفسار أو ترغب في الحصول على ملخص مكتوب أو مناقشة ملاحظات الدراسة ونتائجها، يمكنك التواصل مع الباحث عن طريق إرسال بريد إلكتروني إلى kald6937@uni.sydney.edu.au. سوف يتم تقديم نتائج هذا الاستطلاع من خلال ملخص موجز للمشاركين في الدراسة.

ماذا لو ارغب في المزيد من المعلومات؟

عندما تقرأ هذه المعلومات (ملخص النتائج)، سيكون الباحث متاحًا لمناقشتها معك أكثر والإجابة على أي أسئلة قد تتبادر الى ذهنك.

- الاستاذ خليفه الدغيش (طالب دكتوراه) بجامعة سيدني/ كلية الآداب والعلوم الاجتماعية - كلية التربية والخدمة الاجتماعية. البريد الإلكتروني: kald6937@uni.sydney.edu.au

ماذا لو كان لدي شكوى او أي مخاوف؟

تمت مراجعة هذه الدراسة والموافقة على الجوانب الأخلاقية من قبل لجنة اخلاقيات البحوث البشرية بجامعة سيدني [رقم موافقة لجنة اخلاقيات البحث: ٢٠٢٣/١٧٤] وذلك وفقاً للبيان الوطني للسلوك الأخلاقي في البحوث البشرية (٢٠٠٧).

في حال كنت تعاني من عدم ارتياح او قلق نتيجة للمشاركة في هذه الدراسة، فلا تتردد في التواصل مع أي من الجهات التالية لتقديم المشورة والمساعدة والدعم النفسي. هذه الجهات تقدم استشارات نفسية مجانية يتم مراقبتها من قبل موظفين مؤهلين ومتوفرة على مدار الساعة.

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إذا كان لديك قلق بشأن الطريقة التي أجريت بها هذه الدراسة او كنت تريد تقديم شكوى إلى شخص مستقل عن الدراسة فيرجى الاتصال بالجامعة:

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الاستاذ: خليفه الدغيش (طالب دكتوراه)
البريد الالكتروني: kald6937@uni.sydney.edu.au

اسم المشارك: _____

أوافق على المشاركة في هذه الدراسة البحثية. وبناءً على موافقتي للمشاركة، أؤكد أن:

- تم توضيح دوري في هذه المشاركة البحثية كما قام الباحث بتزويدي بنسخة من بيان/ نموذج معلومات المشارك للاحتفاظ به.
- أدرك ان الغرض من الدراسة هو التحقق من العوامل التي تؤثر على تنفيذ الممارسات القائمة على الأدلة في مدارس ذوي اضطرابات طيف التوحد بالمملكة العربية السعودية.
- أقر بأنه تم شرح وتوضيح مخاطر وفوائد الدراسة لي بشكل مرضي.
- أفهم أنه سيُطلب مني المشاركة في ثلاث اجتماعات مركزة لمناقشة العوامل السياقية الرئيسية التي تعيق تنفيذ الممارسات القائمة على الادلة والحلول المحتملة للتغلب على هذه العوائق، على ان تكون مدة كل لقاء ساعة واحدة.
- أدرك ان مشاركتي قد تكون مسجلة صوتياً او من خلال تسجيل فيديو.
- اتفهم بان قرار المشاركة في هذه الدراسة طوعي تماما.
- انا متأكد ان قرار مشاركتي في هذه الدراسة لن يكون له اي تأثير محتمل مع الفريق البحثي وجامعة سيدني.
- أفهم أن لي مطلق الحرية للإنسحاب من هذه الدراسة في أي وقت كان، كما يمكنني اختيار إلغاء/ سحب أي معلومات قدمتها مسبقا (ما لم تكن البيانات قد تم نشرها او إخفاء هوية المشارك).
- أدرك بأن جلسات النقاش هي نشاط جماعي، وقد لا يكون من الممكن إزالة تعليقاتك الفردية من التسجيلات بمجرد انتهاء الجلسة. ومع ذلك فإنه يحق لي أن اطلب من الباحث استبعاد أي من ردودي المسجلة بالكامل من الدراسة.
- أفهم أن جلسات النقاش هي نشاط جماعي، وأنا ملزم بالحفاظ على سرية أي معلومات سوف يتم مناقشتها من قبل المشاركين والباحثين خلال جلسة المجموعة البؤرية.
- لقد تم إبلاغي بأن سرية المعلومات التي أقدمها اثناء مشاركتي سوف يتم حمايتها ولن تستخدم إلا للأغراض التي وافقت عليها. كما أفهم أن المعلومات التي تحدد هويتي سوف يتم استخدامها فقط بإذن مني، باستثناء ما يقتضيه القانون.
- أفهم أنه قد يتم نشر نتائج هذه الدراسة، وأن المنشورات العلمية لن تحتوي على اسمي أو أي معلومات يمكن ان تقود للتعرف على هويتي.

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- أؤكد على كلا مما يلي:

أوافق على تسجيل مشاركتي (صوتي وفيديو) نعم ❑ لا ❑

اود الحصول على نتائج هذه الدراسة نعم ❑ لا ❑

إذا كانت اجابتك **نعم** ، يرجى تقديم طريقة التواصل المفضلة لديك (البريد الالكتروني/ الهاتف/ عنوان البريد):

_____

_____

_____

_____

- أفهم أنه بعد توقيع نموذج الموافقة هذا وإعادته، سيتم الاحتفاظ به من قبل الباحث ، وأنه يمكنني طلب نسخة في أي وقت.

اسم المشارك _____

التوقيع _____

التاريخ _____

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kingdom of Saudi Arabia

Ministry of education

280

General Administration of Education in Al-Ahsa Governorate

Planning and Development Department

وزارة التعليم
Ministry of Education

Transaction type: internal transaction

Transaction number: 4400654305

Transaction date: 28/12/2022

Attachments: none

to whom it may concern

Name	**KHALIFAH ALDUGHAYSH'S**	**No. civil registry**	**1079074348**
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Educational authority:	**The university of Sydney**	**Academic degree**	**Ph.D**
Research Title	**Knowledge to Action Cycle: Strategic Planning to Transform Effective Autism Intervention into Sustained Practice Among Saudi Arabian Teachers**	**Study tool**	**Surveys Focus group**
Application period	**from 18.04.2023 Until date: 16.07.2023**	**Mission end date**	**01.03.2025**

We inform you that the researcher has submitted a request to facilitate his task in collecting information for the purposes of scientific research from school teachers in Al-Ahsa Governorate. There is no objection to the Planning and Development Department (Education Policy Research Department) facilitating its research mission in accordance with the organizational procedures and regulations in force in the General Administration of Education in Al-Ahsa Governorate

Please accept my greetings and appreciation

Acting Director of Planning and Development Department

Hayat bin Abdulaziz Al-Mulhim

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Invitation to Participate: Research Study on Autism Education

الموضوع: دعوة للمشاركة : دراسة بحثية في مجال التربوي للتوحد
عزيزي مدير(اسم المدرسة)

آمل ان تكونوا بأتم صحة وعافية. انا طالب مبتعث لمرحلة الدكتوراه بجامعة سيدني، واقوم حاليا بإجراء بحث لرسالة الدكتوراه في مجال اضطرابات طيف التوحد. تتضمن الدراسة مجموعة من الاستطلاعات وكذلك جلسات نقاش موجهة للمعلمين والمعلمات لبحث استخدام الممارسات القائمة على الأدلة في مجال اضطرابات طيف التوحد وتحديد العوامل التي من شأنها دعم وتحفيز ذلك.

حصلت هذه الدراسة المقترحة على موافقة لجنة اخلاقيات البحث بجامعة سيدني [برقم ٢٠٢٣/١٧٤] كما تم مراجعتها والموافقة عليها من قبل وكالة التخطيط والتطوير بإدارة تعليم الاحساء. يرجى الاطلاع على المرفقات لمزيد من التفاصيل.

مدرستك مدعوة للمشاركة في الدراسة البحثية وذلك لأنكم تقدمون تعليم عالي الجودة للطلاب المصابين باضطراب طيف التوحد. من مع العلم بأن مشاركة المعلمين او المعلمات المنتسبين لمؤسستكم التعليمية يعتبر تطوعياً تماماً كما يمكن الانسحاب من الدراسة في حال عدم الرغبة في المواصلة. مساهمتك في هذا البحث المقترح له قيمة كبيرة ونأمل ان تكون لنتائجه اثاراً إيجابية طويلة المدى على كيفية تعليم المصابين باضطرابات طيف التوحد.

إذا كنت مهتمًا بالحصول على مزيد من المعلومات حول الدراسة ، أود أن أطلب فرصة زيارة مدرستك أو ترتيب اجتماع عن بُعد للإجابة على أي أسئلة أو مخاوف قد تكون لدى المعلمين أو إدارة المدرسة فيمكنني زيارة مقركم او ترتيب اجتماع عن بعد للإجابة عن استفساراتكم كما لا ينطوي على ذلك اي التزام بالمشاركة. اود ان اشكركم مقدما على تعاونكم للاطلاع على هذا الايميل ودعمكم واتطلع الى الحصول على رد منكم.

مع خالص التحية،

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Appendix H: Distress Protocol Document

Distress Protocols

The research student has years of experience working with teachers and a deep understanding of the broader social context in Saudi Arabia, making him well-equipped to handle and mitigate any potential issues. For the proposed study, various precautions will be taken to avoid or deal with any potential discomfort or harm to participants. The distress protocol is constructed as follows:

- **Before data collecting**
  1. As the research student was developing questions for the surveys and focus group meeting, he **excluded** questions that had the potential to cause discomfort or bias.

  2. Although some questions may cause discomfort, they are essential to the research's objectives and quality. The research student has **identified** questions that might be categorized as **sensitive** and is prepared to address any adverse reactions from participants.

  3. The research student Identified potential participants **at high risk** of harm due to participation in this study. For example, teachers who participate in focus groups are at a higher risk compared to those who participate in surveys due to the confidentiality nature of each methodology (single participant vs. a group of participants).

  4. To minimize any potential discomfort, the **method** of filling out the surveys and the **mode** of attending the focus group discussions were taken into mind (conducted online), particularly since some of the female participants will be unable to physically participate in the meeting due to religious considerations.

  5. **Formulating** the necessary forms, such as the Participant Information Statement (PIS) and the Participant Consent Form (PCF), and ensuring they contain all the information necessary to adequately educate the participants.

  6. Before collecting data from participants, the student researcher will **seek approval** from the University of Sydney's research ethics committee.

- **Initial contact with potential participants**

At the beginning of the researcher's contact with potential participants, the PIC form will be made available for all participants to review. In the case that there are concerns regarding the study or if a participant expresses discomfort or reluctance to participate, the research student will provide further information and highlight the following:

1. Describe the rationale and overall purpose of this investigation.
2. Confirm that participation in this study is entirely voluntary.
3. Inform participants that their identity is anonymous and highly protected.
4. Assure participants that their involvement will not have any impact on their relationships.
5. Give participants sufficient time before making their final decision to take part in this study.
6. Inform participants that not participating is neither beneficial nor harmful.

7. Clarify when and how to withdraw from the study.
8. The research student will emphasize the following to the focus group participants at the first meeting in order to guarantee respectful behaviour and avoid discomfort:
    - All participants should show one another respect as they work to solve the discussion issues.
    - Everyone's viewpoint is equally valuable.
    - No response is incorrect; each person expresses their opinion in light of their own experiences.
    - Everyone must maintain silence and concentrate on the person speaking.
    - Participants have the choice to decline to answer any questions that they do not feel comfortable with or even leave the focus group meetings.
    - Remind attendees to keep phones on silent mode and feel free to leave at any time if they need to respond.

- **<u>During data collection</u>**

The research student will take these actions during data collection to address any distress that may arise among study participants.

1. Improve the participant's ability for emotional communication so that it is risk-free to express their concerns and foster a more relaxed atmosphere in the relationship.

2. Observe the participants' nonverbal clues, such as body language and tone, in order to interact successfully and detect any signs of emotional exhaustion.

3. Make sure that all of the participants in the study are provided with the researcher's contact information and that they are able to utilise it to interact.

4. Follow-up sessions where participants may discuss their experiences and discomfort with the research student are one of the planned procedures.

5. If any participants in the proposed study indicate distress, the research student will act quickly to offer support, confirm their concerns, and resolve any difficulties.

6. If the research student struggles to address participant concerns, he will notify the supervision team and seek advice.

7. By the end of the survey, teachers will be directed to reach out to the researcher if they feel distressed as a result of completing the survey. After that, the researcher will set up a meeting to discuss their concerns and, if necessary, connect them with professional counselling.

8. As shown in the table below, the following distress protocol was developed for the focus group participants.

Distress Protocol for Qualitative Research: Focus Group Meetings		
Assessing and Responding to Participant Discomfort and Offering Support	Scenario 1	Assess the Participant ⇢ You seem uncomfortable. Would you wish to leave or take a break from this focus group meeting? ⇢ No ⇢ continue.
	Scenario 2	Assess the Participant ⇢ You seem uncomfortable. Would you wish to leave or take a break from this focus group meeting? ⇢ Yes ⇢ Pause ⇢ Please let me know when you are ready to join us again ⇢ the Participant joins again and has no sign of distress.
	Scenario 3	Assess the Participant ⇢ You seem uncomfortable. Would you wish to leave or take a break from this focus group meeting? ⇢ Yes ⇢ Leave ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ Yes ⇢ meet and discuss the situation ⇢ the problem is solved, and the Participant is fine now.
	Scenario 4	Assess the Participant ⇢ You seem uncomfortable. Would you wish to leave or take a break from this focus group meeting? ⇢ Yes ⇢ Leave ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ No or refuse to discuss their discomfort or Participant do not feel relief after Follow up stage one ⇢ Follow up stage two ⇢ would like me to connect you with someone to support you ⇢ Yes ⇢ Refer to counselling services or support group.
Responding to Participant Distress During Focus Group Meetings	Scenario 1	Participant verbally expresses discomfort during focus group meetings⇢ Would you wish to leave or take a break from this focus group meeting? ⇢ Yes ⇢ Pause ⇢ Please let me know when you are ready to join us again ⇢ the Participant joins again and has no sign of distress.
	Scenario 2	Participant verbally expresses discomfort during focus group meetings⇢ Would you wish to leave or take a break from this focus group meeting? ⇢ Yes ⇢ Leave ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ Yes ⇢ meet and discuss the situation ⇢ the problem is solved, and the Participant is fine now.
	Scenario 3	Participant verbally expresses discomfort during focus group meetings ⇢ Would you wish to leave or take a break from this focus group meeting? ⇢ Yes ⇢ Leave ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ No or refuse to discuss their discomfort or fail to

		feel relief after Follow up stage one ⇢ Follow-up stage two ⇢ would like me to connect you with someone to support you ⇢ Yes ⇢ Refer to counselling services or a support group.
Responding to Participant Distress After Focus Group Meetings	Scenario 1	Participant verbally expresses discomfort after focus group meeting ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ Yes ⇢ meet and discuss the situation ⇢ the problem is solved, and the Participant is fine now and willing to continue
	Scenario 2	Participant verbally expresses discomfort after focus group meeting ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ No or refuse to discuss their discomfort or fail to feel relief after Follow-up stage one ⇢ Follow-up stage two ⇢ would like me to connect you with someone to support you ⇢ Yes ⇢ Refer to counselling services or a support group.
Responding to Participant Desire to Withdrawal from Focus Group Meeting	Scenario 1	Participant expresses a desire to withdraw entirely from focus group meeting ⇢ would like to discuss the reason for withdrawing or have you experienced any distress during our meeting ⇢ Yes ⇢ Follow up stage one ⇢ Is there a time when we could meet in private, so we could talk about your distress and see if there is anything I can do? ⇢ Yes ⇢ meet and discuss the situation ⇢ the problem is solved, and the Participant is fine now.
	Scenario 2	Participant expresses a desire to withdraw entirely from focus group meeting ⇢ would like to discuss the reason for withdrawing or have you experienced any distress during our meeting ⇢ No or refuse to discuss their discomfort or fail to feel relief after Follow up stage one ⇢ Follow-up stage two ⇢ would like me to connect you with someone to support you ⇢ Yes ⇢ Refer to counselling services or a support group.
	Scenario 3	Participant expresses a desire to withdraw entirely from focus group meeting ⇢ would like to discuss the reason for withdrawing or have you experienced any distress during our meeting ⇢ No, I have not experienced any distress, but I will not be able to attend the upcoming meetings because of my busy schedule ⇢ thanks the Participant for attending and ask what to do with data previously obtained⇢ allow withdrawn.

Appendix I: Teaching Practices Scale Questionnaires and Definitions – Survey

1. **Antecedent-based Intervention**
   This intervention involves variety of circumstantial and environmental modifications in an attempt to reduce challenging behaviours and encourage desirable ones.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

2. **Auditory Integration Training**
   This intervention involves the presentation of modulated sounds through headphones in an attempt to retrain an individual's auditory system with the goal of improving distortions in hearing or sensitivities to sound.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

3. **Augmentative and Alternative Communication**
   Interventions that use a nonverbal/vocal communication system that can be aided (e.g., high tech speech generating devices, communication book) or unaided (e.g., sign language) and/or teaches the use of communication system. Picture Exchange Communication System is considered part of this intervention practice.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

4. **Ayres Sensory Integration**
   This theory or practice aims to create an environment that stimulates or challenges individuals to incorporate sensory information from their body and surroundings to respond with regulated and adaptable behaviour.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

5. **Behavioural Momentum Intervention**
   The sequence of behaviour expectation that promotes low-probability responses by embedding them in a series of high-probability responses.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

6. **Brushing/Wilbarger Protocol**
   This intervention involves the use of brushing over children's skin using firm pressure.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

7. **Cognitive Behavioural/Instructional Strategies**
   Management and regulation of thought processes in order to promote growth and alterations in behaviour, social interactions, and academic performance.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

8. **Collaborative Model for Promoting Competence and Success**
   Continuous coaching to enable families, teachers, students, and consultants work to set personalized IEP objectives using evidence-based strategies throughout the school year to improve achievement.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

9. **Direct Instruction**
   Small-group teaching instruction uses scripted protocols or lessons through choral and independent student responses and uses systematic and explicit error corrections to foster mastery and generalization.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

10. **Differential Reinforcement**
    The aim of this intervention is to increase desirable behaviour through reinforcing alternative behaviour (DRA), incompatible behaviour (DRI), or not engaging in an undesirable behaviour (DRO).

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4

◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

11. Discrete Trial Training

This instruction practice teaches skills in a planned and systematic manner consists of one-to-one educational practise that begins with the teacher's instruction, the child's response, and a pause before the next instruction.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

12. Exercise and Movement

An increase in physical activity is used in these interventions to decrease undesirable behaviours. In addition, training can be used also to enhance fine and gross motor development skills and mindful movement.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

13. Exposure

This intervention focuses on changing stimulus intensity or circumstances to promote the desired behaviour.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

14. Extinction

Withdraws or terminates the reinforcer of an interfering behaviour to reduce or eliminate the future occurrence of that behaviour.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

15. Facilitated Communication

A facilitator supports an individual with limited communication abilities and guides their hand to help them communicate words, phrases, or whole thoughts using a keyboard of words or pictures or typing device.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

16. Functional Behaviour Assessment

A systematic approach for determining the underlying function or purpose of behaviour.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

17. Functional Communication Training

A systematic practice of replacing inappropriate or ineffective behaviour with more appropriate or effective behaviours that serve the same function.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

18. Holding Therapy

This intervention includes a person holding an autistic child closely to ensure eye contact.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

19. Matrix Training

Organizing required skill components such as words along the horizontal and vertical axes of a rectangle, and then methodically teaching combinations of component.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

20. Modelling

This intervention includes demonstrating a desirable behaviour in order to teach it to the learner through imitation.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

21. Multisensory Environments/Snoezelen

A variety of sensory experiences (such as sights, sounds, textures, aromas, and movements) are used to stimulate the sensory systems and fulfil the sensory needs.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

22. Music-Mediated Intervention

Music therapy or intervention that employs songs, musical intonation, or rhythm to teach or promote learning or performance of skills/behavior.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

23. Naturalistic Interventions

A collection of teaching practices used throughout regular routines and activities in the learner's classroom or home setting. This teaching practice also includes JASPER model and Pivotal Response Treatment.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

24. Parent-Implemented Intervention

This intervention trains and employs parents to provide an intervention to their children, recognizing that parents are their children's most effective teachers.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

25. Peer-Based Instruction and Intervention

This intervention aims to improve social skills or other individual learning objectives by allowing students to work together. Teachers also may encourage interaction and provide assistance as necessary. This intervention may incorporate Structured Play Groups.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

26. Prompting

In this teaching practice students are offered verbal, gestural, or physical assistance to help them to acquire new skills or engage in desirable behaviors.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

27. Punishment

Adding an aversive stimulus or removing a pleasant stimulus after an undesired behaviour with the intention of preventing or reducing its occurrences in the future (e.g., response cost).

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

28. Rapid Prompting Method

A teaching method leading towards communication by an assistance trained to prompt an autistic child to point to or tap letters, symbols, or pictures.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

29. Reinforcement

The process of adding positive stimuli or removing negative stimuli following a behaviour to increase its likelihood of occurrence.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

30. Response Interruption/Redirection

This instructional practice involves physically blocking or redirecting disruptive behaviours, and it is frequently used with stereotyped and self-injurious behaviors.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

31. Self-Management

Teaching students to identify appropriate and inappropriate behaviour and then monitor, record, report, and reinforce their own behaviour.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

32. Sensory Diet

This intervention provides sensory input through a daily schedule of activities tailored particularly for the child.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

33. Social Narrative

Written narratives that describe specific social situations in some detail and are aimed at helping the individual to adjust to the situation or adapt their behaviour.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

34. Social Skills Training

This intervention aims to teach student how to socially engage with others in an appropriate and effective manner. Sessions comprise direct explanation of basic social ideas, role-playing or practice, and feedback.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

35. Task Analysis

A procedure in which an activity or behaviour is broken down into a series of smaller, more manageable steps in order to assess and teach them.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

36. Technology-Aided Instruction and Intervention

Instruction or interventions in which technology is the primary focus, and the technology is specifically designed or used to aid in the learning or performance of a behaviour or skill, such as robots, computer or web-based software, device apps, and virtual networks.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

37. Time Delay

This teaching practice used to gradually reduce prompts during instruction. This technique includes a small pause between the initial instruction and the child's response or any following instructions or prompts.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4

◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

38. Video Modelling

This intervention provides a video-recorded example and enables the target behaviour or skill to be practiced through observation and imitation.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

39. Visual Supports

A visual display provides information about an activity, routine, or expectation and/or facilitates skill demonstration. Examples of this instruction include visual schedules, independent work system and scripts.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

40. Weighted Vests/Clothing

This treatment involves the use of weighted clothing to help autistic children in processing sensory information.

Knowledge					Use				
0	1	2	3	4	0	1	2	3	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

❑ **SUBMIT**

Conclusion

Thank you so much for taking the time to complete this survey.
If you have any questions or are experiencing any discomfort as a result of completing this survey, you may email the research student at kald6937@uni.sydney.edu.au.

Appendix J: Demographic Information – Survey

Demographic Data (You are required to provide the following demographic information, with the exception of your name and the name of your school)

Name (Optional) ……..

Name of School (Optional) ……

Age Group

- (Under 25)
- (25- 44)
- (45- 64)
- (Above 64)

Gender

- Male
- Female

Degree Attained

- Diploma
- Bachelor
- Master
- Doctorate
- Other ……

Years of experience

- (Under 5 years)
- (From 6- 15)
- (From 16 to 25 years)
- (Above 25 years)

Language used in classroom

- Arabic
- English
- Arabic &English
- Other…….

Geographical Region

- Central Region
- Eastern Region
- Western Region

- Northern Region
- Southern Region

Role

- Assistant Teacher
- Teacher
- Applied Behaviour Analyst
- Psychologist
- Other ……...

Educational Stage

- Preschool
- Elementary school
- Middle school
- High School
- Other …….

Specialist Degree

- Autism spectrum disorder
- Other Special Education Disciplines
- Other Educational Specialty
- Applied Behaviour Analysis
- Psychology
- Other……...

Employer

- Government educational sector
- Private educational sector

Appendix K: Scale Anchors

Instructions

Please read the descriptions of the following practices and rate your level of knowledge and use of each according to the following criteria:

Knowledge

0	1	2	3	4
Very Little: Know nothing about this practice.	**To a Slight Extent:** Heard of this practice.	**To a Moderate Extent:** Know a little about this practice.	**To a Great Extent:** Have a good amount of knowledge of this practice.	**To a Very Great Extent:** Know a great deal and could instruct other on this.

Use

0	1	2	3	4
Never: I do not use this practice.	**On rare occasion:** Less than once per week.	**Sometimes:** One or more times a week but not everyday.	**Often:** About once per day.	**Frequently:** More than once per day.

Paynter, J. M., Ferguson, S., Fordyce, K., Joosten, A., Paku, S., Stephens, M., Trembath, D., & Keen, D. (2017). Utilisation of evidence-based practices by ASD early intervention service providers. *Autism*, *21*(2), 167-180. https://doi.org/10.1177/1362361316633032

Appendix L: Focus Group Agenda and Questions

Introduction

A. Greet the attendees and express gratitude for their participation in this discussion group, and to any official body that contributed to or allowed this meeting to occur.
B. Introduce myself and briefly overview my research background, current employment, and academic pursuits.
C. Encourage participants to talk and may introduce themselves to one another (Name – Academic qualification – Working site – Current role – Year of experience, etc.).
D. Explain why the purposive sample technique was used to recruit participants and how everyone participating in this study is eligible based on the inclusion criteria.
E. Explain the rationale and the overall purpose of conducting this study.
F. Also, clarify the reason for utilising focus group discussion specifically for this phase and how the collected data will influence and determine the features of the intervention phase.
G. Inform the participants that the session will be recorded using a video camera or zoom recording system.
H. Also, there will be no social, personal, or legal harm of any kind associated with participating in this discussion group, and participants' confidentiality will always come first.
I. Remind study participants that they have the option to leave the discussion session at any time.

Instructions

A. Display the timetable for the meeting activities, total meeting time, when to switch from one activity to another, and the break time.
B. The principal researcher and participants will be presented with clear expectations regarding their roles and responsibilities.
C. Promote respectful behaviour among focus group participants, which may include the following:
    a. All participants should show one another respect as they work to solve the discussion issues.
    b. Everyone's viewpoint is equally valuable.
    c. No response is incorrect; each person expresses their opinion in light of his or her own experiences.

d. It is crucial that everyone maintain silence and concentrate on the person speaking.
e. Remind attendees to keep phones on silent mode and feel free to leave at any time if you need to respond.

Enquiries

- Before we begin the discussion, I will take a brief break to allow study participants to pose questions and seek clarification about any aspect of the research study procedures.

1- Discussion Points and Prompts

Intro: The evidence-based practice strategies for children with ASD are updated regularly, and some improvements and modifications have recently been made to ensure training quality. This continuous improvement may necessitate ongoing teacher training as well as adaptation of new strategies to fit the context of Saudi Arabia.

Main question: What characteristics of Saudi society do you believe should be considered when implementing evidence-based practices with students with autism disorder?

- Do you believe that societies with advanced research in educational autism (original intervention context) may differ from ours (Saudi context) in terms of implementing evidence-based practices in schools with autistic children? Why is that?
- Are there educational demands/skills associated with the Saudi social context that you are repeatedly asked to concentrate on when teaching autistic children? If yes, please describe them.

2- Discussion Points and Prompts

Main question: How, in your opinion, can ignoring the context (social/cultural/religious, etc.) in Saudi Arabia be an important factor in the failure to implement evidence-based strategies with autistic children?

- Do you believe that some teachers or parents use teaching strategies to teach or ASD individuals with, despite the fact that they have not been proven effective or may have a negative impact? If yes, can you give me some examples?

- Do you think that some evidence-based practices should be modified because they do not fit in the social context of Saudi Arabia (too expensive, too time-consuming, very demanding on parents, or not in line with Islamic customs or religion)? What are some examples from everyday life that you could give?

3- Discussion Points and Prompts

Main question: What barriers could inhibit the adoption and implementation of EBP strategies at the macro, school, and individual levels? What solutions are proposed to facilitate adoption of EBP strategies?

- Is there any legislation issued by the Saudi Ministry of Education that may inhibit the implementation of EBP strategies? If so, what exactly are they? What can we be done to overcome or mitigate their influences?
- Do you think that partnerships with universities and related organization can play a role in your continuous professional development? Have you previously benefitted from these partnerships?

- Is there a shortage of qualified trainers in the area of autism-related evidence-based practices in Saudi Arabia? Who are some of the key players in our society who can help promote these teaching approaches and provide periodic training for teachers?

4- Discussion Points and Prompts

- Do you think that school funding, available resources, materials, and equipment are necessary for the implementation of EBP strategies? explain why? What are the associated barriers, and how can they be overcome?

- How can school policy, culture, and general climate be regulated to promote and facilitate the implementation of evidence-based practice in autism classrooms?

- What impact do the following points have on the implementation of evidence-based practices in ASD classroom? How can each school factor facilitate or inhibit the process of implementing the evidence-based practices?

- Size of class
- Time availability
- The awareness of the educational institution's administration.
- Teacher training offered by the institution.
- Personal assistance provided for the teacher.

5- Discussion Points and Prompts

- Do you believe that your college curriculum and previous academic coursework fully prepared you to use evidence-based practices with individuals with autism spectrum disorder? explain your answer?

- Do you believe that teachers in Saudi Arabia accept the idea of continuing professional development that help them adopt evidence-based practices in the classroom? If you said yes, then. The question is, what factors should be considered to promote such efforts?

- From your point of view, how can negative psychological characteristics such as anxiety, lack of self-confidence and occupational fatigue be overcome, to increase teacher execution of EBP?

- Do you believe that the ease of implementation, as well as positive student outcomes, can motivate teachers to adapt evidence-based practices into their daily teaching routine? Can you mention other inspiring factors that could personally motivate teachers to use EBP?

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١ـ محاور النقاش والتوجيه

مقدمة/ يتم تحديث الممارسة القائمة على الأدلة للأطفال المصابين بالتوحد بشكل دوري لضمان جودة التدريب وتحسين أداء المعلمين. قد تستدعي هذه التحديثات المستمرة من الباحثين والجهات ذات الصلة جهودا إضافية لتقديمها وتدريب المعلمين على تفعيلها في غرفة الصف. إضافة الى ما سبق، هذه الممارسات التدريسية ايضا تحتاج الى تكييف لتتناسب مع السياق في المملكة العربية السعودية.

السؤال الرئيسي: ما هي خصائص المجتمع السعودي التي تعتقد أنه يجب مراعاتها عند اختيار وتنفيذ الممارسات القائمة على الأدلة مع التلاميذ المصابين باضطراب التوحد؟

- هل تعتقدون ان المجتمعات المتقدمة التي لديها أبحاث في مجال تدريب الافراد من ذوي اضطراب طيف التوحد (السياق الأصلي) قد تختلف عن مجتمعنا السعودي من حيث تطبيق الممارسات القائمة على الأدلة في مدارس ذوي اضطرابات طيف التوحد؟ ؟ لماذا؟
- هل هناك متطلبات تدريسه/ مهارات مرتبطة بالسياق الاجتماعي السعودي والتي يطلب منك بشكل متكرر من أولياء الامور اكسابها للتلاميذ؟ إذا كانت اجابتك بنعم، ارجو توضيحها؟

٢ـ محاور النقاش والتوجيه

السؤال الرئيسي: كيف يمكن أن يكون (برأيك) تجاهل السياق (اجتماعي / ثقافي / ديني، إلخ) في المملكة العربية السعودية عاملاً مهمًا في فشل تنفيذ الممارسات القائمة على الأدلة مع الأطفال المصابين بالتوحد؟

- هل تعتقد أن بعض أولياء الأمور/ معلمين او غيرهم يستخدمون استراتيجيات معينة، سواء في سياق المدرسة أو المجتمع، لتأهيل الأفراد المصابين بالتوحد، على الرغم من حقيقة أنها لم تثبت فعاليتها أو قد يكون لها تأثير سلبي؟ إذا كانت الإجابة بنعم، هل يمكنك أن تقدم بعض الأمثلة؟
- هل هناك بعض الممارسات القائمة على الأدلة التي تعتقد انها لا تتناسب مع سياقنا الاجتماعي في السعودية (تكلفة عالية/ وقت/ جهد من الوالدين/ لا تتوافق مع العادات او الدين الإسلامي) وتحتاج الى تكييف؟ هل يمكنك تقديم بعض الأمثلة من الواقع؟

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٣- محاور النقاش والتوجيه

السؤال الرئيسي: ما هي العوائق التي يمكن أن تمنع تبني وتنفيذ الممارسات القائمة على الادلة على المستوى الكلي والمدرسة والمستوى الفردي؟ ما هي الحلول المقترحة لتسهيل اعتماد تلك الممارسات؟

- هل هناك بعض القوانين او التشريعات الصادرة عن وزارة التربية والتعليم من شأنها ان تعيق تنفيذ الممارسات القائمة على الأدلة في غرفة الصف؟ ماهي بالضبط؟ ما لذي تقترحه للتغلب على تلك المعيقات او تخفيف أثرها؟
- هل تعتقد ان الشراكات مع الجامعات والمؤسسات ذات الصلة يمكن أن تلعب دورًا في تطويرك المهني المستمر؟ هل استفدت من تلك الشركات سابقا؟
- هل تعتقد ان هناك ندرة في اعداد المدربين المؤهلين في مجال الممارسات القائمة على الأدلة للأفراد التوحديين في المملكة العربية السعودية؟ ماهي الجهات لتي يمكن ان تلعب دورا حيويا لدعم تلك الممارسات التدريسية في مجتمعنا والذين يمكنهم المساعدة في تعزيز مناهج التدريس هذه وتقديم تدريب دوري للمعلمين؟

٤- محاور النقاش والتوجيه

-هل الدعم المالي من المؤسسة التعليمية التي تعمل بها والموارد الأخرى (مواد/ معدات/ تكنولوجيا) ضروري لنجاح تبنى وتنفيذ الممارسات القائمة على الأدلة؟ ما هي العوائق المصاحبة لذلك وكيف يمكن التغلب عليها؟

-كيف يمكن لسياسات المؤسسة التعليمية والمناخ العام وثقافتها المرتبطة بالممارسات التدريسية ان يسهل تبني وتنفيذ الممارسات القائمة على الأدلة؟

-ما هو التأثير الذي يمكنه ان يحدثه كل عامل من العوامل المدرسية المذكورة ادناه لتبني وتنفيذ الممارسات القائمة على الأدلة في مع ذوي اضطراب طيف التوحد في غرفة الصف؟ كيف يمكن لكل عامل مدرسي مذكور ادناه أن يسهل عمليه تبني وتنفيذ الممارسات القائمة على الأدلة وكيف يمكن ان يحدث عكس ذلك؟

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٥- محاور النقاش والتوجيه

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-هل تعتقد ان تعليمك الجامعي والمناهج الاكاديمية التي درستها مسبقا كانت كافية لإعدادك بشكل جيد لتطبيق الممارسات القائمة على الأدلة مع تلاميذ ذوي اضطراب طيف التوحد؟ اشرح اجابتك؟

- هل تعتقد ان المعلمين في المملكة العربية السعودية متقبلين لفكرة التعليم المستمر لتطوير قدراتهم للتطبيق الممارسات القائمة على الأدلة في غرفة الصف؟ إذا كانت اجابتك بنعم. ماهي الأمور التي يجب اخذها في الحسبان لتشجيع هذه المبادرات.

- كيف يمكن التغلب على الخصائص النفسية السلبية مثل القلق وقلة الثقة بالنفس والإرهاق المهني لزيادة تبني وتنفيذ الممارسات القائمة لدى المعلمين؟

-هل تعتقد أن سهولة التنفيذ، وكذلك النتائج الإيجابية للطلاب، يمكن أن تحفز المعلمين على تبني تفعيل الممارسات القائمة على الأدلة في رويتنهم التدريسي اليومي؟ هل يمكنك ذكر العوامل الملهمة الأخرى التي يمكن أن تحفز المعلمين شخصيًا على استخدام الممارسات القائمة على الأدلة؟

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Appendix N: PowerPoint Slides – Focus Group Meetings

دورة المعرفة إلى العمل: التخطيط الاستراتيجي لنقل التدخلات القائمة على الأدلة في مجال اضطرابات طيف التوحد إلى ممارسات مستدامة بين المعلمين والمعلمات في المملكة العربية السعودية

كلية الآداب والعلوم الاجتماعية، كلية التربية بجامعة سيدني





- تستخدم **المجموعات البؤرية** لجمع البيانات من مجموعة صغيرة من المشاركين من خلال تسليط الضوء على قضية معينة والاجابة على بعض التساؤلات المرتبطة.

- اثناء هذا اللقاء سوف نقوم بمناقشة احتياجات المعلمين والمعلمات الأكثر إلحاحًا، وكذلك تحديد الحواجز السياقية الرئيسية التي تعيق الاستفادة من الممارسات القائمة على الأدلة واقتراح الحلول الممكنة للتغلب على هذه الحواجز.

- يتم تحديث الممارسة القائمة على الأدلة بشكل دوري وقد تستدعي هذه التحديثات المستمرة من الباحثين والجهات ذات الصلة جهودا إضافية لتقديمها وتدريب المعلمين على تفعيلها في غرفة الصف.

- تعتبر وجهة نظر الجميع ذات قيمة متساوية واختلاف الآراء يثري قيمة النقاش بحيث يعبر كل شخص عن رأيه في ضوء تجاربه الخاصة.



THE UNIVERSITY OF SYDNEY

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محور النقاش الأول

ما هي خصائص المجتمع السعودي التي تعتقدون أنه يجب مراعاتها عند اختيار وتنفيذ الممارسات القائمة على الأدلة مع التلاميذ المصابين باضطراب التوحد؟

- هل تعتقدون ان المجتمعات المتقدمة التي لديها أبحاث في مجال تدريب الافراد من ذوي اضطراب طيف التوحد (السياق الأصلي) قد تختلف عن مجتمعنا السعودي من حيث تطبيق الممارسات القائمة على الأدلة في مدارس ذوي اضطرابات طيف التوحد؟ ؟ لماذا؟

- هل هناك مهارات مرتبطة بالسياق الاجتماعي السعودي والتي يطلب منك بشكل متكرر من أولياء الامور اكسابها للتلاميذ؟ إذا كانت اجابتك بنعم، ارجو ذكر بعض الامثلة؟

محور النقاش الثاني

كيف يمكن أن يكون (برأيك) تجاهل السياق (اجتماعي / ثقافي / ديني، إلخ) في المملكة العربية السعودية عاملاً مهمًا في فشل تنفيذ الممارسات القائمة على الأدلة مع الأطفال المصابين بالتوحد؟

- هل تعتقدون أن بعض أولياء الأمور/ المعلمات او غيرهم يستخدمون استراتيجيات معينة، سواء في سياق المدرسة أو المجتمع، لتأهيل الأفراد المصابين بالتوحد، على الرغم من حقيقة أنها لم تثبت فعاليتها أو قد يكون لها تأثير سلبي؟ إذا كانت الإجابة بنعم، هل يمكنك أن تقدم بعض الأمثلة؟

- هل هناك بعض الممارسات القائمة على الأدلة التي لا تتناسب مع سياقنا الاجتماعي في السعودية (تكلفة عالية/ وقت/ جهد من الوالدين/ لا تتوافق مع العادات او الدين الإسلامي) وتحتاج الى تكييف؟ هل يمكنك تقديم بعض الأمثلة من الواقع؟

محور النقاش الربع

هل الدعم المالي من المؤسسة التعليمية التي تعمل بها والموارد الأخرى (مواد/ معدات/ تكنولوجيا) ضروري لنجاح تبنى وتنفيذ الممارسات القائمة على الأدلة؟ ما هي العوائق المصاحبة لذلك وكيف يمكن التغلب عليها؟

-كيف يمكن لسياسات المؤسسة التعليمية والمناخ العام وثقافتها المرتبطة بالممارسات التدريسية ان يسهل تبني وتنفيذ الممارسات القائمة على الأدلة؟

-ما هو التأثير الذي يمكنه ان يحدثه كل عامل من العوامل المدرسية المذكورة ادناه لتبني وتنفيذ الممارسات القائمة على الأدلة في مع ذوي اضطراب طيف التوحد في غرفة الصف؟ كيف يمكن لكل عامل مدرسي مذكور ادناه أن يسهل عمليه تبني وتنفيذ الممارسات القائمة على الأدلة وكيف يمكن ان يحدث عكس ذلك؟

-عدد التلاميذ

-توافر الوقت

-درجة وعي ادارة المؤسسة التعليمية

-التدريب الذي تقدمه المؤسسة التعليمية للمعلمات

-الدعم الشخصي المقدم للمعلمة

محور النقاش الخامس

-هل تعتقدي ان تعليمك الجامعي والمناهج الاكاديمية التي درستها مسبقا كانت كافية لإعدادك بشكل جيد لتطبيق الممارسات القائمة على الأدلة مع تلاميذ ذوي اضطراب طيف التوحد؟ اشرحي اجابتك؟

- هل تعتقدي ان المعلمات في المملكة العربية السعودية متقبلين لفكرة التعليم المستمر لتطوير قدراتهم للتطبيق الممارسات القائمة على الأدلة في غرفة الصف؟ إذا كانت اجابتك بنعم. ماهي الأمور التي يجب اخذها في الحسبان لتشجيع هذه المبادرات.

- كيف يمكن التغلب على الخصائص النفسية السلبية مثل القلق وقلة الثقة بالنفس والإرهاق المهني لزيادة تبني وتنفيذ الممارسات القائمة لدى المعلمات؟

-هل تعتقدي أن سهولة التنفيذ، وكذلك النتائج الإيجابية للطالبات، يمكن أن تحفز المعلمات على تبني تفعيل الممارسات القائمة على الأدلة في رويتنهم التدريسي اليومي؟ هل يمكنك ذكر العوامل الملهمة الأخرى التي يمكن أن تحفز المعلمات شخصيًا على استخدام الممارسات القائمة على الأدلة؟

كل الشكر والتقدير لكم

لحضور وإنجاح هذه الجلسات

كما اشكر ايضا كل من ساهم في إتمام وتسهيل

هذه المهمة

في حال كان لديك أي استفسار أو ترغب في الحصول على ملخص مكتوب أو مناقشة ملاحظات عن الدراسة أو نتائجها يمكنك التواصل مع الباحث عن طريق إرسال بريد إلكتروني إلى

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Appendix O: Male vs Female Teachers' Ratings of Specific Teaching Practices – All Comparisons

Teaching Practices	Male		Female		Statistical Comparisons		
	Mean	Std. Deviation	Mean	Std. Deviation	t	sig.	Cohen's d
Knowledge – Evidence-based Practices							
Reinforcement (K)	3.07	1.23	3.34	1.17	-1.16	0.25	-0.23
Prompting (K)	3.02	1.15	3.19	1.19	-0.76	0.45	-0.15
Direct Instruction (K)	2.86	1.32	3.02	1.39	-0.59	0.55	-0.12
Modelling (K)	2.81	1.27	3.06	1.31	-1.00	0.32	-0.20
Peer-Based Instruction and Intervention (K)	2.85	1.28	2.81	1.35	0.15	0.88	0.03
Video Modelling (K)	2.75	1.32	2.94	1.24	-0.76	0.45	-0.15
Extinction (K)	2.83	1.30	2.81	1.53	0.08	0.94	0.02
Discrete Trial Training (K)	2.59	1.32	2.98	1.29	-1.51	0.13	-0.30
Exercise and Movement (K)	2.68	1.41	2.85	1.34	-0.64	0.52	-0.13
Visual Supports (K)	2.56	1.38	2.98	1.38	-1.56	0.12	-0.30
Differential Reinforcement (K)	2.73	1.24	2.72	1.39	0.02	0.98	0.00
Task Analysis (K)	2.64	1.26	2.83	1.37	-0.73	0.47	-0.14
Antecedent-based Intervention (K)	2.71	1.27	2.72	1.06	-0.05	0.96	-0.01
Parent-Implemented Intervention (K)	2.59	1.38	2.85	1.37	-0.96	0.34	-0.19
Social Skills Training (K)	2.69	1.30	2.72	1.36	-0.11	0.91	-0.02
Self-Management (K)	2.66	1.25	2.53	1.33	0.51	0.61	0.10
Response Interruption/Redirection (K)	2.58	1.34	2.60	1.42	-0.07	0.94	-0.01
Technology-Aided Instruction and Intervention (K)	2.51	1.34	2.66	1.46	-0.55	0.58	-0.11
Cognitive Behavioural/Instructional Strategies (K)	2.69	1.16	2.36	1.41	1.34	0.19	0.26
Functional Communication Training (K)	2.49	1.38	2.62	1.39	-0.46	0.64	-0.09
Augmentative & Alternative Communication (K)	2.44	1.39	2.40	1.51	0.13	0.90	0.03
Functional Behaviour Assessment (K)	2.44	1.37	2.40	1.35	0.14	0.89	0.03

Time Delay (K)	2.34	1.33	2.49	1.41	-0.56	0.58	-0.11
Social Narrative (K)	2.27	1.40	2.51	1.37	-0.88	0.38	-0.17
Naturalistic Interventions (K)	2.29	1.31	2.28	1.49	0.04	0.97	0.01
Behavioural Momentum Intervention (K)	2.27	1.26	1.89	1.42	1.45	0.15	0.28
Ayres Sensory Integration (K)	1.93	1.41	1.66	1.46	.97	0.33	0.19
Music-Mediated Intervention (K)	1.83	1.49	2.34	1.49	-1.75	0.08	-0.34
Knowledge – Emerging Practices							
Punishment (K)	2.95	1.22	2.91	1.35	0.14	0.89	0.03
Collaborative Model for Promoting Competence and Success (K)	2.64	1.34	2.47	1.54	0.63	0.53	0.12
Exposure (K)	2.24	1.34	2.49	1.30	-0.97	0.33	-0.19
Matrix Training (K)	1.41	1.42	1.34	1.45	0.24	0.81	0.05
Knowledge – Unsupported practices							
Rapid Prompting Method (K)	2.93	1.19	2.94	1.41	-0.02	0.99	0.00
Facilitated Communication (K)	2.68	1.48	2.83	1.32	-0.55	0.58	-0.11
Multisensory Environments/Snoezelen (K)	2.42	1.30	2.51	1.38	-0.33	0.74	-0.07
Sensory Diet (K)	2.10	1.48	2.17	1.61	-0.23	0.82	-0.05
Holding Therapy (K)	1.97	1.44	1.98	1.39	-0.05	0.96	-0.01
Auditory Integration Training (K)	1.97	1.45	1.77	1.43	0.71	0.48	0.14
Weighted Vests/Clothing (K)	1.78	1.55	1.98	1.54	-0.66	0.51	-0.13
Brushing/Wilbarger Protocol (K)	1.22	1.37	1.11	1.39	0.42	0.67	0.08
Use – Evidence-based Practices							
Reinforcement (U)	3.05	1.14	3.26	1.11	-0.93	0.36	-0.18
Prompting (U)	2.75	1.21	3.15	1.10	-1.77	0.08	-0.35
Direct Instruction (U)	**2.51**	**1.41**	**3.02**	**1.24**	**-1.96**	**0.05**	**-0.38**
Modelling (U)	2.58	1.26	2.89	1.22	-1.31	0.20	-0.26
Peer-Based Instruction and Intervention (U)	2.34	1.20	2.49	1.32	-0.61	0.54	-0.12
Video Modelling (U)	2.54	1.26	2.55	1.35	-0.04	0.97	-0.01
Extinction (U)	2.75	1.31	2.85	1.40	-0.40	0.69	-0.08
Discrete Trial Training (U)	**2.42**	**1.37**	**3.04**	**1.18**	**-2.46**	**0.02**	**-0.48**
Exercise and Movement (U)	2.27	1.40	2.70	1.30	-1.62	0.11	-0.32
Visual Supports (U)	2.39	1.34	2.79	1.28	-1.55	0.13	-0.30

Differential Reinforcement (U)	2.53	1.28	2.79	1.30	-1.04	0.30	-0.20
Task Analysis (U)	2.47	1.22	2.83	1.24	-1.48	0.14	-0.29
Antecedent-based Intervention (U)	2.54	1.25	2.57	1.04	-0.14	0.89	-0.03
Parent-Implemented Intervention (U)	1.97	1.43	2.47	1.35	-1.84	0.07	-0.36
Social Skills Training (U)	2.49	1.33	2.55	1.28	-0.24	0.81	-0.05
Self-Management (U)	2.27	1.35	2.21	1.38	0.22	0.83	0.04
Response Interruption/Redirection (U)	2.31	1.38	2.60	1.31	-1.10	0.27	-0.22
Technology-Aided Instruction and Intervention (U)	2.34	1.31	2.36	1.47	-0.08	0.93	-0.02
Cognitive Behavioural/Instructional Strategies (U)	2.31	1.38	2.34	1.37	-0.13	0.90	-0.03
Functional Communication Training (U)	2.27	1.34	2.38	1.50	-0.41	0.69	-0.08
Augmentative and Alternative Communication (U)	2.19	1.43	2.26	1.57	-0.24	0.81	-0.05
Functional Behaviour Assessment (U)	2.07	1.26	2.30	1.43	-0.88	0.38	-0.17
Time Delay (U)	2.12	1.30	2.38	1.31	-1.04	0.30	-0.20
Social Narrative (U)	1.90	1.41	1.96	1.33	-0.22	0.83	-0.04
Naturalistic Interventions (U)	2.14	1.32	2.09	1.47	0.19	0.85	0.04
Ayres Sensory Integration (U)	1.81	1.38	1.43	1.47	1.40	0.17	0.27
Behavioural Momentum Intervention (U)	1.85	1.27	1.83	1.46	0.07	0.95	0.01
Music-Mediated Intervention (U)	1.47	1.39	1.72	1.46	-0.90	0.37	-0.18
Use – Emerging practices							
Punishment (U)	2.66	1.21	2.55	1.43	0.42	0.68	0.08
Collaborative Model for Promoting Competence and Success (U)	2.27	1.35	2.55	1.44	-1.04	0.30	-0.20
Exposure (U)	**1.93**	**1.26**	**2.45**	**1.38**	**-2.00**	**0.05**	**-0.39**
Matrix Training (U)	1.19	1.40	1.17	1.39	0.06	0.95	0.01
Use – Unsupported practices							
Rapid Prompting Method (U)	2.68	1.27	2.83	1.31	-0.61	0.55	-0.12
Facilitated Communication (U)	2.51	1.43	2.40	1.41	0.38	0.71	0.07

Multisensory Environments/Snoezelen (U)	2.20	1.35	2.32	1.30	-0.45	0.66	-0.09
Holding Therapy (U)	1.78	1.48	1.62	1.42	0.57	0.57	0.11
Sensory Diet (U)	1.76	1.39	1.62	1.54	0.51	0.61	0.10
Auditory Integration Training (U)	1.41	1.46	1.21	1.40	0.69	0.49	0.14
Weighted Vests/Clothing (U)	1.19	1.31	1.45	1.46	-0.97	0.34	-0.19
Brushing/Wilbarger Protocol (U)	0.93	1.26	0.91	1.28	0.07	0.94	0.01

Note. Differences statistically significant at least on the .05 level are given in bold.

Appendix P: Public vs Private School Teachers' Ratings of Specific Teaching Practices – All Comparisons

Employer	Government Educational Sector		Private Educational Sector				
	Mean	Std. Deviation	Mean	Std. Deviation	t	sig.	Cohen's d
Knowledge – Evidence-based Practices							
Reinforcement (K)	3.12	1.27	3.48	0.87	-1.23	0.22	-0.30
Prompting (K)	3.08	1.22	3.14	0.96	-0.21	0.83	-0.05
Direct Instruction (K)	2.93	1.39	2.95	1.20	-0.07	0.95	-0.02
Modelling (K)	2.93	1.31	2.90	1.22	0.08	0.94	0.02
Peer-Based Instruction and Intervention (K)	2.79	1.29	3.00	1.38	-0.66	0.51	-0.16
Video Modelling (K)	2.80	1.34	2.95	1.07	-0.49	0.63	-0.12
Extinction (K)	2.86	1.36	2.67	1.59	0.56	0.58	0.14
Discrete Trial Training (K)	2.72	1.32	2.95	1.32	-0.73	0.47	-0.18
Exercise and Movement (K)	2.68	1.41	3.05	1.20	-1.09	0.28	-0.27
Visual Supports (K)	2.75	1.38	2.71	1.45	0.11	0.91	0.03
Differential Reinforcement (K)	2.66	1.31	3.00	1.30	-1.07	0.29	-0.26
Task Analysis (K)	2.81	1.29	2.38	1.36	1.36	0.18	0.33
Antecedent-based Intervention (K)	2.71	1.21	2.76	1.04	-0.19	0.85	-0.05
Parent-Implemented Intervention (K)	2.62	1.37	3.05	1.36	-1.27	0.21	-0.31
Social Skills Training (K)	2.60	1.32	3.14	1.28	-1.70	0.09	-0.41
Self-Management (K)	2.53	1.32	2.90	1.14	-1.20	0.23	-0.29
Response Interruption/Redirection (K)	2.59	1.34	2.57	1.54	0.05	0.96	0.01
Technology-Aided Instruction and Intervention (K)	2.60	1.39	2.48	1.44	0.36	0.72	0.09
Cognitive Behavioural/Instructional Strategies (K)	2.46	1.27	2.90	1.30	-1.44	0.15	-0.35
Functional Communication Training (K)	2.55	1.36	2.52	1.50	0.09	0.93	0.02
Augmentative & Alternative Communication (K)	2.39	1.45	2.57	1.43	-0.52	0.60	-0.13
Functional Behaviour Assessment (K)	2.33	1.34	2.81	1.37	-1.47	0.15	-0.36
Time Delay (K)	2.40	1.38	2.43	1.33	-0.09	0.93	-0.02
Social Narrative (K)	2.31	1.40	2.67	1.32	-1.07	0.29	-0.26

Naturalistic Interventions (K)	2.20	1.33	2.62	1.60	-1.25	0.22	-0.30
Behavioural Momentum Intervention (K)	2.06	1.33	2.29	1.38	-0.69	0.49	-0.17
Ayres Sensory Integration (K)	1.74	1.43	2.10	1.45	-1.01	0.31	-0.25
Music-Mediated Intervention (K)	**1.86**	**1.50**	**2.86**	**1.28**	**-2.81**	**0.01**	**-0.69**
Knowledge – Emergent Practices							
Punishment (K)	2.82	1.34	3.38	0.87	-1.81	0.07	-0.44
Collaborative Model for Promoting Competence and Success (K)	2.52	1.40	2.76	1.55	-0.70	0.49	-0.17
Exposure (K)	2.27	1.30	2.67	1.43	-1.23	0.22	-0.30
Matrix Training (K)	1.38	1.40	1.38	1.56	-0.01	0.99	0.00
Knowledge – Unsupported Practices							
Rapid Prompting Method (K)	2.84	1.30	3.33	1.16	-1.61	0.11	-0.39
Facilitated Communication (K)	2.72	1.42	2.86	1.39	-0.41	0.69	-0.10
Multisensory Environments/Snoezelen (K)	2.46	1.31	2.48	1.44	-0.05	0.96	-0.01
Sensory Diet (K)	2.06	1.53	2.43	1.54	-0.99	0.32	-0.24
Holding Therapy (K)	1.96	1.44	2.00	1.34	-0.10	0.92	-0.03
Auditory Integration Training (K)	**1.72**	**1.42**	**2.52**	**1.37**	**-2.35**	**0.02**	**-0.57**
Weighted Vests/Clothing (K)	1.86	1.58	1.90	1.41	-0.12	0.90	-0.03
Brushing/Wilbarger Protocol (K)	1.14	1.35	1.29	1.49	-0.43	0.67	-0.11
Use – Evidence-based Practices							
Reinforcement (U)	3.07	1.16	3.43	0.93	-1.31	0.19	-0.32
Prompting (U)	2.92	1.23	2.95	0.97	-0.12	0.90	-0.03
Direct Instruction (U)	2.76	1.37	2.62	1.32	0.44	0.66	0.11
Modelling (U)	2.78	1.23	2.48	1.33	0.99	0.33	0.24
Peer-Based Instruction and Intervention (U)	2.39	1.26	2.48	1.21	-0.29	0.77	-0.07
Video Modelling (U)	2.62	1.26	2.24	1.41	1.22	0.22	0.30
Extinction (U)	2.76	1.36	2.90	1.30	-0.43	0.67	-0.10
Discrete Trial Training (U)	2.71	1.34	2.67	1.28	0.12	0.90	0.03
Exercise and Movement (U)	2.41	1.43	2.67	1.07	-0.76	0.45	-0.19
Visual Supports (U)	2.66	1.24	2.19	1.60	1.46	0.15	0.36
Differential Reinforcement (U)	2.58	1.33	2.90	1.09	-1.05	0.30	-0.26
Task Analysis (U)	2.74	1.23	2.19	1.21	1.85	0.07	0.45

Antecedent-based Intervention (U)	2.48	1.16	2.86	1.11	-1.34	0.18	-0.33
Parent-Implemented Intervention (U)	2.18	1.44	2.24	1.30	-0.18	0.86	-0.04
Social Skills Training (U)	2.41	1.33	2.95	1.12	-1.72	0.09	-0.42
Self-Management (U)	2.16	1.37	2.57	1.29	-1.23	0.22	-0.30
Response Interruption/Redirection (U)	2.45	1.33	2.38	1.47	0.20	0.84	0.05
Technology-Aided Instruction and Intervention (U)	2.39	1.37	2.19	1.40	0.59	0.56	0.14
Cognitive Behavioural/Instructional Strategies (U)	**2.18**	**1.36**	**2.90**	**1.30**	**-2.22**	**0.03**	**-0.54**
Functional Communication Training (U)	2.33	1.37	2.29	1.59	0.13	0.90	0.03
Augmentative and Alternative Communication (U)	2.11	1.49	2.67	1.43	-1.56	0.12	-0.38
Functional Behaviour Assessment (U)	2.05	1.32	2.67	1.32	-1.93	0.06	-0.47
Time Delay (U)	2.24	1.32	2.24	1.26	-0.01	0.99	0.00
Social Narrative (U)	1.95	1.36	1.81	1.44	0.43	0.67	0.10
Naturalistic Interventions (U)	1.99	1.32	2.62	1.53	-1.90	0.06	-0.46
Behavioural Momentum Intervention (U)	1.73	1.30	2.29	1.49	-1.70	0.09	-0.42
Ayres Sensory Integration (U)	1.55	1.43	2.00	1.41	-1.29	0.20	-0.31
Music-Mediated Intervention (U)	**1.36**	**1.34**	**2.48**	**1.44**	**-3.37**	**p<.01**	**-0.82**
Use – Emergent Practices							
Punishment (U)	2.53	1.29	2.95	1.36	-1.33	0.19	-0.33
Collaborative Model for Promoting Competence and Success (U)	2.32	1.41	2.71	1.31	-1.17	0.24	-0.29
Exposure (U)	**2.02**	**1.28**	**2.71**	**1.42**	**-2.17**	**0.03**	**-0.53**
Matrix Training (U)	1.11	1.32	1.48	1.63	-1.10	0.28	-0.27
Use – Unsupported Practices							
Rapid Prompting Method (U)	2.69	1.27	2.95	1.32	-0.83	0.41	-0.20
Facilitated Communication (U)	2.39	1.43	2.76	1.34	-1.08	0.28	-0.26
Multisensory Environments/Snoezelen (U)	2.22	1.33	2.38	1.32	-0.49	0.63	-0.12
Holding Therapy (U)	1.73	1.45	1.62	1.47	0.31	0.76	0.08
Sensory Diet (U)	1.64	1.49	1.95	1.32	-0.89	0.37	-0.22

Auditory Integration Training (U)	1.28	1.44	1.48	1.40	-0.55	0.58	-0.14
Weighted Vests/Clothing (U)	1.25	1.40	1.52	1.29	-0.83	0.41	-0.20
Brushing/Wilbarger Protocol (U)	0.84	1.19	1.29	1.49	-1.47	0.14	-0.36

Note. Differences statistically significant at least on the .05 level are given in bold.

Appendix Q: Teachers' Ratings of Specific Teaching Practices by Experience Level – All Comparisons

Years of experience	Under 5 years		From 5 to 15 years		16 years and more					
	Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**	**F**	**sig.**	**Omega square**	**Post hoc**
Knowledge – Evidence-based Practices										
Reinforcement (K)	2.89	1.42	3.36	1.07	2.80	1.32	2.12	0.13	0.02	
Prompting (K)	2.78	1.40	3.29	1.03	2.60	1.17	2.97	0.06	0.04	
Direct Instruction (K)	2.63	1.57	3.12	1.20	2.50	1.58	1.89	0.16	0.02	
Modelling (K)	**2.44**	**1.50**	**3.16**	**1.12**	**2.60**	**1.43**	**3.52**	**0.03**	**0.05**	**(5-15 higher than Under 5, d=-0.57, p=0.04)**
Peer-Based Instruction and Intervention (K)	2.52	1.67	2.97	1.14	2.70	1.25	1.23	0.30	0.00	
Video Modelling (K)	2.44	1.45	2.99	1.21	2.80	1.23	1.75	0.18	0.01	
Extinction (K)	**2.15**	**1.68**	**3.10**	**1.23**	**2.70**	**1.16**	**4.88**	**0.01**	**0.07**	**(5-15 higher than Under 5, d=-0.71, p=0.01)**
Discrete Trial Training (K)	2.44	1.60	2.96	1.13	2.30	1.49	2.22	0.11	0.02	
Exercise and Movement (K)	2.56	1.58	2.94	1.21	2.00	1.63	2.51	0.09	0.03	
Visual Supports (K)	2.44	1.63	2.91	1.27	2.40	1.43	1.46	0.24	0.01	

Differential Reinforcement (K)	2.41	1.58	2.90	1.17	2.40	1.35	1.74	0.18	0.01	
Task Analysis (K)	**2.11**	**1.58**	**2.99**	**1.12**	**2.60**	**1.27**	**4.71**	**0.01**	**0.07**	**(5-15 higher than Under 5, d=-0.69, p=0.01)**
Antecedent-based Intervention (K)	**2.19**	**1.30**	**2.90**	**1.06**	**2.90**	**1.29**	**3.90**	**0.02**	**0.05**	**(5-15 higher than Under 5, d=-0.62, p=0.02)**
Parent-Implemented Intervention (K)	2.48	1.70	2.78	1.25	2.80	1.32	0.49	0.62	-0.01	
Social Skills Training (K)	2.67	1.59	2.80	1.20	2.20	1.40	0.90	0.41	0.00	
Self-Management (K)	2.30	1.49	2.75	1.21	2.40	1.17	1.38	0.26	0.01	
Response Interruption/Redirection (K)	2.11	1.58	2.78	1.28	2.50	1.18	2.41	0.10	0.03	
Technology-Aided Instruction and Intervention (K)	2.11	1.63	2.80	1.26	2.30	1.42	2.65	0.08	0.03	
Cognitive Behavioural/Instructional Strategies (K)	2.30	1.56	2.59	1.16	2.90	1.29	0.94	0.39	0.00	
Functional Communication Training (K)	**1.96**	**1.63**	**2.80**	**1.23**	**2.40**	**1.27**	**3.79**	**0.03**	**0.05**	**(5-15 higher than Under 5, d=-0.62, p=0.02)**
Augmentative & Alternative Communication (K)	2.00	1.47	2.64	1.40	2.10	1.45	2.23	0.11	0.02	

Functional Behaviour Assessment (K)	2.00	1.54	2.59	1.28	2.40	1.17	1.91	0.15	0.02	
Time Delay (K)	1.96	1.56	2.59	1.26	2.30	1.34	2.16	0.12	0.02	
Social Narrative (K)	2.30	1.59	2.43	1.35	2.20	1.14	0.19	0.83	-0.02	
Naturalistic Interventions (K)	2.04	1.63	2.36	1.32	2.40	1.17	0.57	0.57	-0.01	
Ayres Sensory Integration (K)	1.63	1.47	1.91	1.44	1.60	1.35	0.49	0.61	-0.01	
Behavioural Momentum Intervention (K)	1.63	1.45	2.25	1.29	2.40	1.17	2.40	0.10	0.03	
Music-Mediated Intervention (K)	2.30	1.56	2.04	1.52	1.50	1.18	1.03	0.36	0.00	
Knowledge – Emerging practices										
Punishment (K)	2.74	1.46	3.04	1.21	2.70	1.25	0.73	0.48	-0.01	
Collaborative Model for Promoting Competence and Success (K)	2.26	1.66	2.72	1.34	2.30	1.34	1.23	0.30	0.00	
Exposure (K)	2.00	1.62	2.52	1.22	2.10	0.99	1.73	0.18	0.01	
Matrix Training (K)	1.19	1.44	1.42	1.41	1.60	1.58	0.40	0.68	-0.01	
Knowledge – Unsupported Practices										
Rapid Prompting Method (K)	2.63	1.57	3.09	1.13	2.70	1.34	1.43	0.24	0.01	
Facilitated Communication (K)	**2.30**	**1.61**	**3.00**	**1.26**	**2.20**	**1.48**	**3.40**	**0.04**	**0.04**	**(5-15 marginally higher than Under 5, d=-0.51, p=0.08)**
Multisensory Environments/Snoezelen (K)	2.04	1.56	2.68	1.18	2.10	1.45	2.77	0.07	0.03	
Holding Therapy (K)	1.78	1.50	2.09	1.42	1.70	1.06	0.67	0.52	-0.01	

Auditory Integration Training (K)	2.00	1.52	1.83	1.40	1.90	1.60	0.14	0.87	-0.02	
Sensory Diet (K)	1.96	1.63	2.19	1.53	2.20	1.40	0.22	0.81	-0.02	
Weighted Vests/Clothing (K)	1.81	1.55	1.94	1.58	1.50	1.35	0.38	0.69	-0.01	
Brushing/Wilbarger Protocol (K)	1.22	1.40	1.22	1.40	0.70	1.06	0.65	0.53	-0.01	
Use – Evidence-based Practices										
Reinforcement (U)	2.85	1.41	3.32	0.93	2.70	1.34	2.60	0.08	0.03	
Prompting (U)	2.63	1.36	3.09	1.08	2.60	1.17	1.92	0.15	0.02	
Direct Instruction (U)	**2.33**	**1.54**	**3.00**	**1.19**	**2.00**	**1.49**	**4.22**	**0.02**	**0.06**	**(5-15 marginally higher than Under 5, d=-0.51, p=0.08, and 16 years or more, d=0.76, p=0.08)**
Modelling (U)	**2.15**	**1.51**	**3.01**	**1.02**	**2.20**	**1.32**	**6.20**	**p<0.01**	**0.09**	**(5-15 higher than Under 5, d=-0.73, p=0.01)**
Peer-Based Instruction and Intervention (U)	2.15	1.41	2.57	1.12	2.00	1.56	1.69	0.19	0.01	
Video Modelling (U)	2.11	1.48	2.75	1.18	2.30	1.34	2.67	0.07	0.03	
Extinction (U)	2.33	1.62	3.00	1.20	2.60	1.27	2.58	0.08	0.03	
Discrete Trial Training (U)	**2.22**	**1.58**	**2.96**	**1.09**	**2.20**	**1.62**	**4.02**	**0.02**	**0.05**	**(5-15 higher than Under 5, d=-0.57, p=0.04)**
Exercise and Movement (U)	2.26	1.40	2.64	1.33	1.80	1.40	2.08	0.13	0.02	

Visual Supports (U)	**2.07**	**1.64**	**2.81**	**1.12**	**2.20**	**1.40**	**3.60**	**0.03**	**0.05**	**(5-15 higher than Under 5, d=-0.57, p=.04)**
Differential Reinforcement (U)	2.37	1.55	2.80	1.17	2.30	1.25	1.47	0.24	0.01	
Task Analysis (U)	**1.93**	**1.41**	**2.93**	**1.06**	**2.50**	**1.18**	**7.18**	**p<0.01**	**0.11**	**(5-15 higher than Under 5, d=-0.86, p<.01)**
Antecedent-based Intervention (U)	2.15	1.41	2.71	0.99	2.60	1.35	2.36	0.10	0.03	
Parent-Implemented Intervention (U)	1.78	1.37	2.35	1.40	2.20	1.48	1.61	0.21	0.01	
Social Skills Training (U)	2.52	1.53	2.57	1.21	2.20	1.40	0.34	0.71	-0.01	
Self-Management (U)	1.96	1.51	2.38	1.29	2.10	1.45	0.96	0.39	0.00	
Response Interruption/Redirection (U)	2.00	1.52	2.61	1.26	2.40	1.35	2.01	0.14	0.02	
Technology-Aided Instruction and Intervention (U)	1.85	1.61	2.55	1.24	2.30	1.34	2.60	0.08	0.03	
Cognitive Behavioural/Instructional Strategies (U)	2.15	1.59	2.43	1.24	2.00	1.63	0.72	0.49	-0.01	
Functional Communication Training (U)	**1.70**	**1.64**	**2.58**	**1.28**	**2.20**	**1.14**	**4.04**	**0.02**	**0.06**	**(5-15 higher than Under 5, d=-0.64, p=0.02)**
Augmentative and Alternative Communication (U)	1.96	1.61	2.35	1.44	2.00	1.49	0.77	0.47	0.00	

Functional Behaviour Assessment (U)	1.85	1.56	2.32	1.24	2.00	1.25	1.29	0.28	0.01	
Time Delay (U)	**1.70**	**1.24**	**2.45**	**1.30**	**2.20**	**1.23**	**3.31**	**0.04**	**0.04**	**(5-15 higher than Under 5, d=-0.58, p=0.04)**
Social Narrative (U)	1.70	1.44	2.01	1.37	1.90	1.29	0.50	0.61	-0.01	
Naturalistic Interventions (U)	2.04	1.63	2.13	1.31	2.20	1.32	0.07	0.94	-0.02	
Behavioural Momentum Intervention (U)	1.63	1.57	1.91	1.28	1.90	1.29	0.43	0.65	-0.01	
Music-Mediated Intervention (U)	1.81	1.55	1.59	1.42	0.90	0.88	1.53	0.22	0.01	
Ayres Sensory Integration (U)	1.56	1.42	1.70	1.47	1.50	1.27	0.15	0.87	-0.02	
Use – Emerging Practices										
Punishment (U)	2.52	1.60	2.64	1.20	2.70	1.25	0.10	0.90	-0.02	
Collaborative Model for Promoting Competence and Success (U)	2.04	1.56	2.61	1.30	1.90	1.37	2.40	0.10	0.03	
Exposure (U)	1.96	1.63	2.26	1.24	2.00	1.05	0.56	0.57	-0.01	
Matrix Training (U)	1.04	1.45	1.17	1.34	1.60	1.58	0.60	0.55	-0.01	
Use – Unsupported Practices										
Rapid Prompting Method (U)	2.41	1.53	2.88	1.15	2.70	1.42	1.36	0.26	0.01	
Facilitated Communication (U)	2.04	1.63	2.70	1.28	2.00	1.49	2.78	0.07	0.03	
Multisensory Environments/Snoezelen (U)	1.81	1.39	2.48	1.24	1.90	1.45	2.94	0.06	0.04	
Holding Therapy (U)	1.41	1.58	1.84	1.42	1.60	1.27	0.90	0.41	0.00	

Sensory Diet (U)	1.37	1.25	1.83	1.53	1.70	1.42	0.95	0.39	0.00
Auditory Integration Training (U)	1.11	1.40	1.35	1.40	1.70	1.77	0.65	0.53	-0.01
Weighted Vests/Clothing (U)	1.30	1.27	1.36	1.44	0.90	1.29	0.49	0.61	-0.01
Brushing/Wilbarger Protocol (U)	1.07	1.39	0.90	1.25	0.70	1.06	0.36	0.70	-0.01

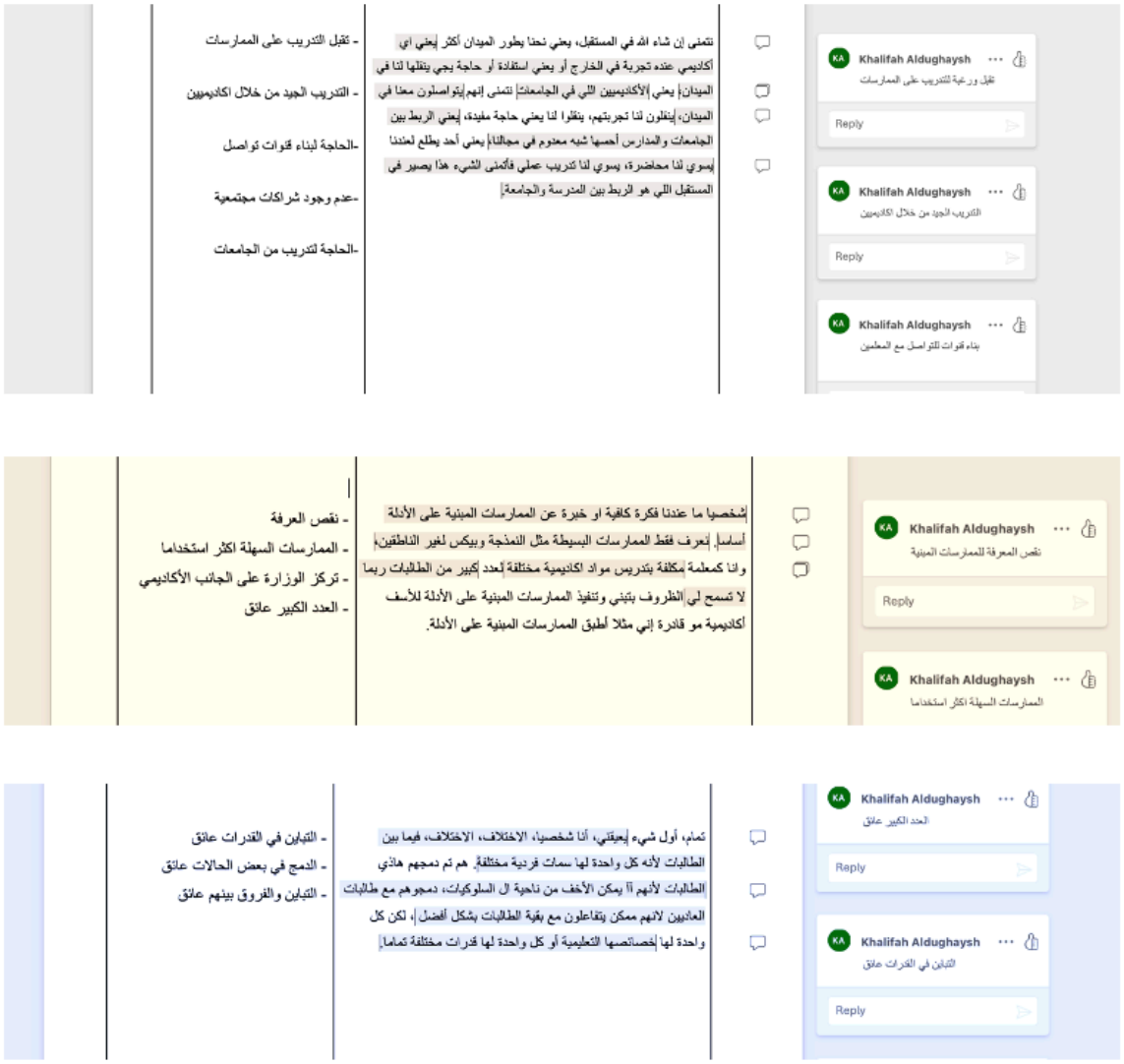
Note. Differences statistically significant at least on the .05 level are given in bold.

Appendix R: Illustrative Samples of Coding and Theme Development

The displayed samples below are shown only as a very small portion of the raw data and analysis processes for transparency purposes. The screenshots were extracted from both male and female teachers' data to show the variety of codes, themes, and analysis procedures. The figures below are presented in chronological order, from beginning to end. More details are discussed in Chapter 6 under the reflexive thematic analysis procedures.

Figure R.1

Examples of Raw Data Taken from the FG meetings and Codes



Note. The three examples of raw data come from different datasets. Highlighted segments were coded, while irrelevant ones were ignored. The codes in the tables reflect those developed after multiple revisions. The following figure illustrates the gradual development of these codes.

Figure R.2

Examples of the First Round of Coding



Note. The figure presents the first attempt to create codes and group them into potential themes. Hundreds of codes were identified in this stage. These cods were somewhat long and, in many cases, carried more than one idea. Because the analysis is iterative, the codes were refined and examined multiple times.

Figure R.3

Examples of Refined Codes from Male and Female Teachers' Focus Group meetings.



Note. The figure shows the refined codes. The number after each code indicates exactly where it came from. In this stage, the codes were reviewed to check the appropriateness of the code labels and if they are long or carry more than one idea. They were highlighted in different colours for potential emerging patterns, but the actual themes had not yet developed.

Figure R.4

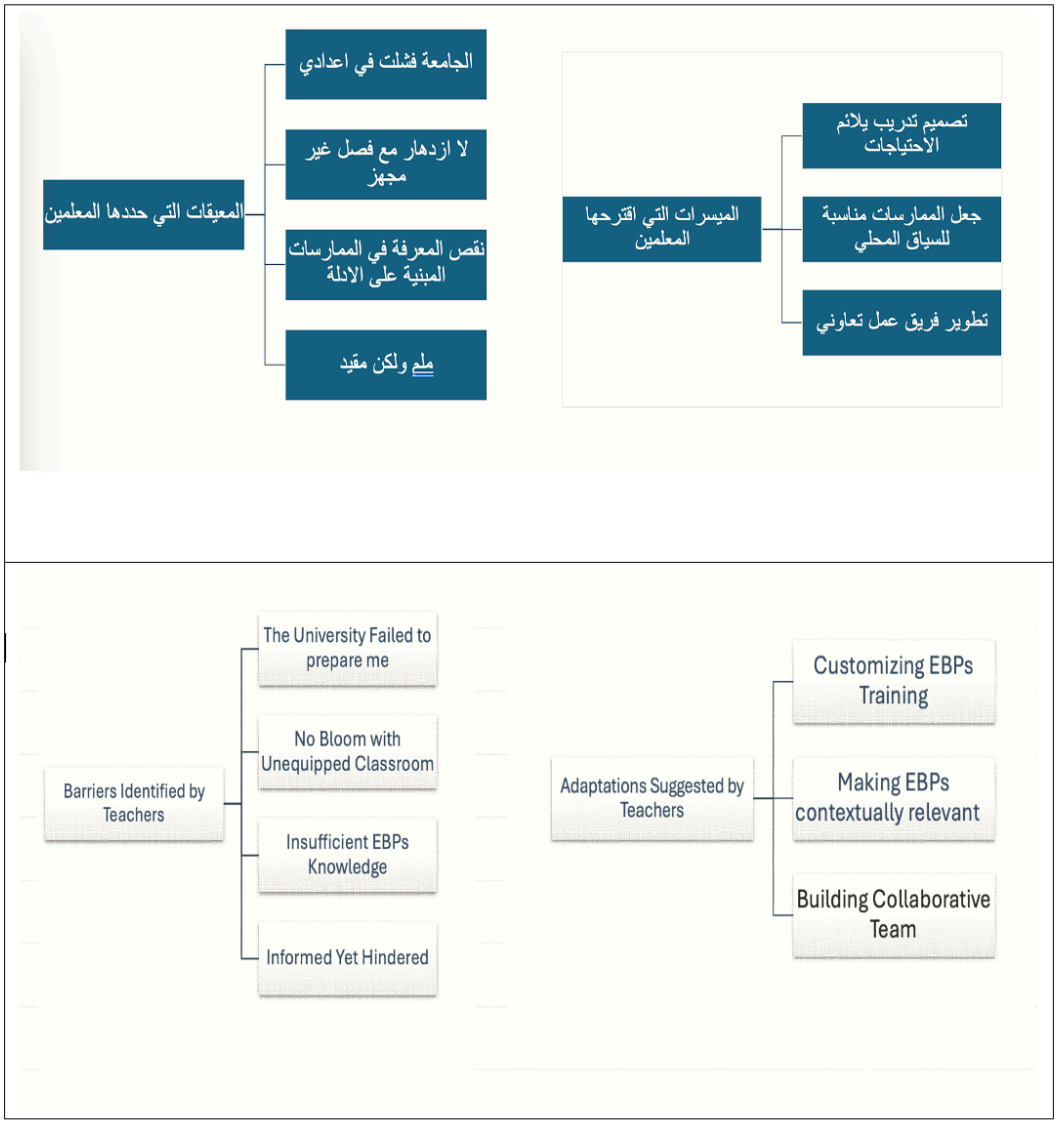
Examples of the Initial Themes Generated



Note. The themes above were generated after careful examination of codes to define commonalities and relationships. More than 15 themes were developed in this early analysis stage. These themes were refined and modified during subsequent analysis procedures. Under the blue-highlighted theme are examples of codes brought together into a candidate theme.

Figure R.5

Development of Final Themes Generated in Arabic and Translated into English



Note. These themes were generated after multiple rounds of reviewing and examining their coherence and ensuring that each has clear boundaries and stands on a central idea. Their numbers decreased after many of them merged. Barriers identified by teachers include four themes, while three themes were developed as facilitators for EBPs implementation.

Figure R.6

Examples of Refined Codes Grouped Together into one Final Theme



	Codes/ترميز		
تصميم تدريب يلائم الاحتياجات Customizing EBPs Training	الحاجة لبرامج شراكة تدريبية	تبادل زيارات مع الاقران	مدربين محليين
	دورات باللغة العربية	مدربين مؤهلين	تطويع التكنولوجيا للتدريب
	تخصيص دورات ABA	اعتماد عدد متدربين قليل	دورات تلائم الثقافة والدين
	تدريب الأسر ضرورة	قنوات تفاعلية لتحديد نوعية التدريب	تخصيص وقت التدريب اثناء الدوام
	التدريب ميداني وتفاعلي	الحاجة الى التركيز على الأبحاث	التدريب يكون بداية ونهاية السنة
	التدريب مستمر	تدريب يعتمد لغة بسيطة	الحصول على تغذية راجعة بعد التدريب
	التدريب من خلال الاستشارات	التدريب تفاعلي وميداني	حوافز مادية للتدريب

Note. These codes all demonstrate a strong connection to one another and contribute to building a single theme. These codes mainly focus on contextually and culturally appropriate training, tailored to teachers' needs, delivered in an interactive and practical manner, using simple language by professional trainers, and providing ongoing feedback. All codes together support the development of the theme “Customising EBPs Training”.

- The following examples show how themes were re-named during the final analysis procedures.

Name of the themes

Informed yet constrained - changed to - Administrative and structural obstacles

Building collaborative team - changed to - Building teams and enhancing collaboration

No bloom with unequipped classroom- changed to - Failure to thrive in an ill-equipped classroom

The themes’ names change contentiously during the analysis, especially when collapsing themes together. The above examples occurred in the very last step, when the themes were well developed and stand alone, with clear boundaries; yet the change was for the purpose of clarity, based on Braun and Clarke (2022) for naming and defining themes.