

## Synchronous Internet Therapy for Panic Disorder: How Does it Compare to Face-to-face Therapy?

### 1. Introduction

#### 1.1. Internet Therapy

##### 1.1.1. Overview

The last several decades have been witness to a revolution in computer and Internet technology that has allowed many Australians access to a plethora of information and services. The Internet is rapidly becoming an accessible and common piece of Australian household and workplace technology (Christensen & Griffiths, 2000). In 2005, the Australian Bureau of Statistics (ABS) reported there were 5.98 million Internet Service Provider (ISP) subscribers (ABS, 2005). Of these, over 5.1 million were household subscribers, indicating that an estimated 60% of the population have access to the Internet at home. These numbers have risen dramatically since the inception of the Internet, and continue to do so. Furthermore, the number of subscribers opting for faster, non dial-up connections increased by 39% in a 3-month period in 2005 to over 30% of total ISP subscribers, whereas the dial-up subscribers continued to fall to under 70% in the same time-frame (ABS, 2005). These statistics indicate that not only is the Internet being accessed by the majority of Australians, but that the speed and quality of the Internet is improving. Although the percentage of Internet access is

lower for the rural population, the number of farmers and other rural residents subscribing to ISPs is rapidly increasing (ABS, 2005).

Furthermore, research shows that many ISP subscribers are increasingly performing health-related searches online. A survey in 2005 estimated that 55% of Internet users conducted health-related searches on the World Wide Web (www) at least monthly (AC Nielson Australia, 2005). With this information, it is understandable that providing health information and services across the Internet is a popular and contentious topic of debate. An individual may now receive advice, information and treatment in a plethora of health fields, including medical, pharmaceutical, and as will be discussed at length in this paper, psychological.

There are many plausible reasons why an individual would choose to acquire psychological information and assistance over the Internet rather than the more traditional and orthodox methods of consulting a mental health professional by phone or face-to-face (Christensen & Griffiths, 2000). One reason is the ability to access a mental health professional. In many rural parts of Australia, there are extremely restricted mental health services available. It is not particularly cost-effective for mental health professionals to move to the rural and remote parts of Australia, nor is it time effective as both the client and therapist often need to travel a great distance to meet face-to-face (FTF). Therefore it is potentially much more cost- and time-effective for the rural population to access help online. Similarly, people with physical restrictions and

their carers are not easily able to access FTF mental health information and services. Therefore it is also suitable for these individuals to access such information online.

Another reason why individuals may prefer to access mental health information and help online is the stigma of mental health difficulties among the community, making it difficult for those wanting mental health assistance to ask for it. Conducting an online search for information does not require a person to reveal his/her identity, nor does the person need to speak to or meet anyone. Using the Internet for mental health questions and issues gives the consumer the anonymity that allows him/her to obtain information and receive services without the commonly associated "shame". Additionally, as the aforementioned statistics indicate, many Australians have regular access to the Internet, and therefore have regular and convenient access to a multitude of health-related information and services. Online information is readily available, can be regularly updated, and is often provided in an attractive and interactive format. However, the information is not always accurate, and some have shared their concerns regarding these inaccuracies (e.g. Morahan-Martin, 2004).

A further explanation for the popularity of accessing health information online is the convenience of such practices. Individuals can conduct online searches for health information at a time and place that suits them, which may be in their lunch hour at work, or at home in the middle of the night. Thus the

Internet has the potential to increase awareness of health issues, and in particular mental health issues, as well as assisting in the prevention, education and treatment of an array of mental health problems (Christensen & Griffiths, 2000).

There are a number of different ways to access mental health assistance online (Oh, Rizo, Enkin, & Jadad, 2005). The simplest form is to access information about mental health problems and services via various websites on the www (e.g., [www.BeyondBlue.org.au](http://www.BeyondBlue.org.au); [www.crufad.com](http://www.crufad.com)). Other forms involve receiving help from a mental health professional over the Internet, which is often called Internet Therapy.

### 1.1.2. Definitions

Internet Therapy (IT) is one of a number of terms, describing a number of ways to deliver treatment over the Internet. By definition, it is “any type of professional therapeutic interaction that makes use of the Internet to connect qualified mental health professionals and their clients” (Rochlen, Zack, & Speyer, 2004, p. 270). Other terms for IT, which are mostly interchangeable with each other, include Cybercounselling, Online Therapy, Internet-based Treatment, E-therapy and Interapy (Lange, et al., 2000; Richards, Klein, & Carlbring, 2003).

There are a number of different types of Internet therapies available. These forms can be divided into synchronous/asynchronous, group/one-on-one,

and therapist-mediated/self-guided subsections. Synchronous forms of IT are conducted in real time and generally involve a chat-room. This means that the dialogue is simultaneous, and allows a conversation to occur between both parties in real time (Andersson, Stromgren, Strom, & Lyttkens, 2002).

Synchronous IT is considered to be the most similar to traditional FTF therapy. As the speed of the Internet improves, so does the pace at which synchronous IT can be delivered and received. However, synchronous IT understandably remains slower than FTF therapy as it requires typing and reading questions and answers, rather than simply speaking and hearing them. Synchronous IT has been considered as a possible adjunct to or replacement of traditional FTF therapy, especially for those who are unable to access FTF treatment, such as people in rural communities and those with physical and hearing impairments.

Asynchronous IT does not happen simultaneously, and often uses an e-mail system between client and therapist. This type of treatment generally occurs over a number of hours or days, as the client receives an email with questions and suggestions from the therapist (e.g., a suggestion to try a certain breathing technique or a new way to challenge thoughts). The client then carries out these suggestions in his/her own time over a number of hours or days, then replies to the therapist with comments and questions, and so on (Klein & Richards, 2001; Yager 2003b). Another form of asynchronous IT includes displaying messages on a virtual message board, and then waiting for the reply. This is similar to the email type of IT in that it is not a conversation that happens

simultaneously or in real time, but usually happens over a number of hours or days. Asynchronous IT is thought to be more convenient than attending FTF or synchronous therapy as both the client and therapist may respond at a time that suits them. However, it can also become frustrating as clients may need to wait a number of days to receive a response to a question that they feel is important, and if there is a misunderstanding or miscommunication between therapist and client, it can take several days for this confusion to be allayed.

Both synchronous and asynchronous forms of therapy can be conducted in either one-on-one (private) or group format. One-on-one IT simply means that there is one client receiving the information that the therapist is sending, and that the information that the client is sending is only received by the therapist. One-on-one IT shares the same benefits as private FTF, in that it is individually tailored to the client's needs. However, individual therapy also has some negative aspects including being expensive, time-consuming for therapists and it lacks the experiences and assistance of others in a similar situation or experiencing similar problems.

Group therapy, however, means that there are two or more clients receiving the same information, and these clients also converse with each other throughout therapy. For example, when group IT is synchronous, there are two or more clients logged on in the same chat-room at the same time, to discuss the same kinds of issues. As previously mentioned, group IT can be beneficial as it

is time- and cost-effective compared to individual therapy, and it also allows the clients to share experiences, which often has a normalizing effect. However, the time spent on each individual decreases as the number of clients in the group increases, and the treatment is not as individual and personal as in one-on-one IT. Also, the issues of security and confidentiality are introduced when there is more than one client present in IT at the same time.

Finally, IT can be therapist-mediated or self-guided. Therapist-mediated IT is therapy that involves and is conducted by a mental health professional (i.e., the therapist writes e-mails, or responds to the client in the chat-room). During therapist-mediated IT, like that of traditional FTF therapy, all questions the client asks are answered by a mental health professional, and all advice is tailored to the individual client.

Self-guided IT, however, does not involve a mental health professional, and is often a computer program or similar Internet-based program that has definite and distinct information and answers depending on the client's responses. Self-guided IT is designed to reduce the time therapists spend with each client, and allows therapy to be received whenever it is suitable for the client. However, this style of IT is considered to be similar to self-help therapies such as bibliotherapy, rather than replicating traditional FTF therapy. It often does not allow for deviations from the standard treatment protocol, or for questions to be asked by clients if they are confused and wish to clarify the

information given on the program.

In the interests of improving access to mental health treatment for the rural community, as well as other populations with limited access to mental health assistance, the current study aimed to evaluate synchronous, therapist-mediated, one-on-one IT.

### 1.1.3. Internet Therapy Websites

There is an increasing number of IT websites becoming available on the Internet. Griffiths, Farrer and Christensen (2006) reviewed several sites offering free, evidence-based online treatment. At [www.feelbetter.org](http://www.feelbetter.org) individuals may access an interactive program that offers information and training in cognitive restructuring for depression. The user determines the pace, and it contains 8 modules or chapters. Another website offering Internet-based therapy for depression is MoodGYM found at [www.moodgym.anu.edu.au](http://www.moodgym.anu.edu.au). MoodGYM consists of 5 chapters covering topics such as cognitive restructuring, pleasant events, relaxation, problem-solving and assertiveness training. BluePages ([www.bluepages.anu.edu.au](http://www.bluepages.anu.edu.au)) is a website designed to offer information and psychoeducation on depression. The site also contains useful links to other websites offering more interactive programs and online support groups. The final website reviewed by Griffiths et al. (2006) was the Online Anxiety Prevention Project, found at [www2.psy.uq.edu.au/~jkweb](http://www2.psy.uq.edu.au/~jkweb). This website includes a 6-module cognitive-behavioural therapy (CBT) program for anxiety and anxiety assessment



instruments.

Other websites offering IT include the Making Changes website ([www.makingchanges.com.au](http://www.makingchanges.com.au)), which lists a variety of IT services available for sale to individuals. Such services include information and manuals, access to message boards that are regularly answered by clinical psychologists, and synchronous chat-based IT. Another commercial website is [www.etherapy.com.au](http://www.etherapy.com.au), which offers access to a number of online or Internet therapists for a fixed price. Consumers of the service are able to choose from synchronous chat-based treatment with or without the use of a telephone, or asynchronous email therapy.

#### 1.1.4. Costs and Benefits of Internet Therapy

Numerous papers have debated the implications of IT at length (Barnett & Scheetz, 2003). While the arguments for and against IT given in the literature are quite extensive, a detailed summary of these will be provided below.

Australia is a large country consisting of many isolated rural areas. Mental health professionals are relatively scarce in these areas, and often the rural population has to travel to a main town or city to obtain treatment for mental health problems. This can be a very costly exercise with respect to both time and money; hence many people living in remote areas of Australia do not seek treatment for mental health problems (Caldwell et al., 2004). IT can provide the

means to deliver psychological treatment to people in remote areas of Australia without the need to travel long distances. For those who cannot access the Internet from home, supplying the local general practitioner's practice with a computer connected to the Internet, for example, would allow the town's population access to a mental health professional without the travel. Hence, IT is seen as a very cost-effective means of delivering therapy, especially with respect to those living in remote areas of the country.

In addition to those living in remote areas, there are many other populations that can benefit from IT. The fact that the client does not need to leave the house to receive treatment means that it is accessible to a much larger range of people. Individuals with a hearing impairment are able to participate in IT. Also, people with a physical disability who might find travelling difficult and arduous can benefit from IT. Carers may also be in a similar position, and can hence benefit from the convenience of IT (Castelnuovo, Gaggioli, Mantovani, & Riva, 2003a, 2003b). IT can also be of benefit to those working full time with little opportunity to access a clinic during working hours as it allows treatment to be conveniently given at any time of night or day, and can also be administered in a person's lunch break without the client having to leave his/her desk. It has also been argued that people who have severe agoraphobia who find it difficult to leave the house can benefit from IT (Kenardy, McCafferty, & Rosa, 2003). People with severe agoraphobia often have trouble seeking FTF treatment, as they are required to leave their safety zone in order to do so, which triggers

intense feelings of anxiety and panic. IT can potentially allow a person with severe agoraphobia to acquire the necessary skills to leave the house, and if still required, to access FTF therapy.

Only a small percentage of the population with mental illness actually seek assistance (Christensen & Griffiths, 2000). IT is a useful resource to help reach a wider population who would benefit from mental health advice or assistance. Mental health practitioners and academics in favour of IT have also argued that people may find IT less confronting than FTF therapy, and hence easier to disclose personal or embarrassing information (Styra, 2004). Rochlen et al., (2004) argues that receiving therapy over the Internet rather than FTF can help to reduce inhibitions and associated awkwardness that the client may have. That is, clients are not as concerned of giving honest and accurate accounts of their thoughts and behaviours as they do not have to observe their therapist's reaction to it. Hence clients may find it easier to get to the core of their problem more rapidly in IT as there are less social masks to remove than in FTF therapy. Additionally, not being FTF can also help to reduce the power differential between therapist and client, as both the client and therapist are doing identical activities, exchanging text, rather than the therapist visibly taking notes of what the client is saying, for example. With these factors working in IT's favour, externalisation of the problem as well as remaining focused on the goals of treatment may be easier to achieve and maintain compared to that of FTF (Rochlen et al., 2004). As mentioned earlier, accessing health information and

help online is more convenient, as many people have access to the Internet at home and/or at work. Combining the convenience of accessing a mental health practitioner online with the reported lower levels of embarrassment potentially equates to more people accessing mental health information and help online who would not (or could not) normally seek help.

Suler (2004) stipulates that writing is therapeutic in itself, and can lead to a more thorough understanding of the client's concerns for both the therapist and client. He talks of the "zone of reflection", where the writer is encouraged and required to deeply reflect on his/her concerns in order to convey them to another in the form of writing. Reflecting on what to write and how to write it, and then writing and sending it, results in an introspective and valuable therapeutic technique.

Accessing mental health services online also has the benefits of the advanced technology that IT requires. That is, once a client can access IT, they can also access an ever-increasing array of resources at the same time. Therapists can recommend websites (including their own), for their clients to refer to during or between therapy sessions to assist with the progress in reaching their therapeutic goals. Additionally, the technology being employed also saves the data and text being exchanged. Therefore, both the client and the therapist have a verbatim record of each session. Clients can review these sessions at any time in the future, to remember what their tasks were for the

week, refresh their memory of the skills learnt that week or in previous weeks, and also to review treatment at a later date if the symptoms start to return.

There are benefits of IT that are associated with specific types of mental illnesses. For example, people with severe agoraphobia find it difficult to leave the house and/or travel far from their home to receive the necessary treatment that is instrumental in their recovery. By using IT, these people are able to access treatment without being required to leave their safety zone, hence making therapy much more accessible and possible for this population. Another population that can benefit from IT is those with social phobia. Social phobia typically involves becoming anxious in social situations. Individuals with social phobia often worry that others can sense their discomfort, and can see them shaking, becoming flushed, sweating, etc. when in social or performance situations. As a result, they often avoid these situations as much as possible. Consequentially, often those who fear social interaction do not seek treatment, as the treatment itself requires social interaction. This conundrum can be greatly reduced by employing IT, so that the social interaction is minimised. IT can potentially act as an adjunct to FTF therapy in these situations, where IT can equip individuals with the necessary skills to then seek a more orthodox method of treatment if required (National Institute for Clinical Excellence, 2002).

With these positive aspects of IT come a number of arguments against its use. Such arguments can be divided into two categories: ethical and practical.

Ethical arguments are based on the Australian Psychological Society's (APS's) Code of Ethics, which states that clinicians are "...to promote sound professional practice in order to safeguard the welfare of consumers of psychological services" (Australian Psychological Society, 2003, p.5). One of the more poignant arguments against IT is the question of duty of care. That is, when the client is at risk of harming him/herself or others, to what extent can the Internet therapist safeguard the client and those around him/her and perform crisis intervention if necessary (Carlbring, Ekselius, & Andersson, 2003; 2005). If a client suddenly becomes aggressive or suicidal, the therapist is not in a position to ensure the client's safety if s/he is in another city, or even in another suburb. Although the therapist can attempt to relieve the client's distress, there is no guarantee that the client will continue to read the text being written and participate in the session. When treating aggressive or suicidal clients FTF, therapists are able to attempt to contain them until the therapist is certain they are no longer a threat, or the therapist can contact suitable support to ensure constant supervision and safety. IT, however, does not allow such reliable supervision or monitoring. With this scenario in mind, one begins to understand the importance of conducting a thorough initial assessment to establish risks of aggression, self-harm and suicidality and therefore determine whether or not the individual would be suitable for IT (National Institute for Clinical Excellence, 2002).

Additionally, if the client has only ever been treated over the Internet, there

is no way of ensuring the client's identity and/or contact details. Hence, if a client requires urgent attention, medical or otherwise, the Internet therapist is of little assistance if s/he has incorrect personal and/or contact details. However, such an argument could also be put forward for FTF therapy, in that clients may present their therapist with false personal and/or contact details. One way to ensure the correct contact details are obtained is to mail the initial instructions/passwords, etc. to the stated address, so that therapy can only be commenced once these details have been verified.

Furthermore, an ethical dilemma commonly discussed in the IT literature is the question of treating clients across different jurisdictional boundaries. That is, in the aforementioned scenario where the therapist cannot establish the contact details of the client, the therapist does not know what state, territory, or country the client is living in. Therefore, what laws and codes of conduct would the therapist be acting under? Some Australian Psychology Boards have made this conundrum obsolete by allowing Internet therapists to provide a service only to clients who reside in the same state that they are practicing in.

Another argument against IT is the ethical implications of delivering a type of treatment that has yet to be empirically validated. The APS's Code of Ethics states that "[p]sychologists can not be sure of their competence online since there is still scant research comparing the efficacy of online interventions with face to face work." (p. 5, Australian Psychology Society, 2003). This argument

demonstrates the importance of research into the efficacy of IT, especially compared to FTF therapy.

The issue of security has been raised as a concern a number of times with regard to IT. However, with the security of the Internet rapidly improving with the introduction and progression of data encryption and chat-rooms/websites being password protected, this argument is becoming somewhat dated. The Internet therapist is responsible for ensuring a suitable encryption program and password protected IT website, just like the FTF therapist is responsible for locking the client files in a sturdy filing cabinet when not being used. Currently, the online security technology has the potential to keep client details more secure than the current and conventional methods (Rochlen et al., 2004).

Other arguments against the use of IT involve practical problems or difficulties that can be experienced whilst administering or receiving IT. Generally it uses more time to write and send a phrase than it does to say it. Hence, a synchronous session of IT is not as comprehensive as a session of FTF therapy of the same length, or it would take more sessions of IT to cover the same amount of material in a session of FTF therapy (Wright, 2003). That is, one session of FTF therapy may be the equivalent of two or three sessions of IT. Therefore the time-effectiveness and cost-effectiveness of IT is questionable and yet to be established. Such a time delay may also get frustrating and perhaps boring for both the client and the therapist. Such an argument does not apply as



much to asynchronous IT, as reading can sometimes be more rapid than listening to the same number of words. Internet-related technology is rapidly evolving, with relatively inexpensive web-cams becoming readily available ([www.logitech.com](http://www.logitech.com)). Webcam technology can be used over free Internet services such as Skype ([www.skype.com](http://www.skype.com)), hence offering a FTF-style treatment over the Internet and combining many of the benefits that both FTF and IT offer.

Rapport is considered a vital component of psychological therapy. Some have argued that establishing rapport over the Internet could be very difficult. Research has indicated, however, that rapport can be developed over the Internet (Cook & Doyle, 2002). Further research into the development of rapport throughout the course of IT is required.

An integral component of therapy is not only the verbal correspondence between therapist and client, but also the nonverbal interactions. Nonverbal cues allow a range of information, such as how the clients are feeling, whether they are shy or anxious, manic or depressed, as well as whether they are being truthful or secretive, whether they understand the material being discussed, and how comfortable they are with the setting. However the Internet does not afford nonverbal interactions. A client's (and therapist's) affect, facial expressions and tone of voice cannot be communicated over the Internet, which can often lead to misunderstandings, as well as it being harder to detect progress and fluctuations in mood. The lack of nonverbal cues also makes humour quite difficult to use

and understand in IT, which may have been suitable to the needs of the client, and the therapist may therefore be required to adapt his/her style accordingly. Humour is one example of potential miscommunications that may take place during IT. Although FTF therapy is not void of miscommunications, they can be quickly questioned and in turn explained. However, IT is more exposed to miscommunications for the reasons mentioned above, and it is much more time consuming to clear up these misinterpretations, if they are cleared at all.

Finally, IT requires a specific level of computer literacy and verbal articulacy from both the client and the therapist. Although FTF therapy certainly does require a high level of competency of the therapist, there are few prerequisites for an individual to receive treatment. IT, however, requires the therapist to not only be a competent and well-trained clinician, but also to have a good typing speed, as well as a decent understanding of computer and Internet technology. The client, also, must have a fair typing speed and understanding of computers in order to operate the programs used in IT and benefit from treatment as much as possible. Individuals with language problems may not benefit from IT as greatly as verbally able individuals.

Currently the most popular recommendation is that IT be used as an adjunct to FTF therapy (Kenardy & Adams, 1993; Yager, 2003a). Perhaps the client could be seen FTF on a monthly basis, and have the remaining sessions online. This method allows regular contact with a mental health professional

even for those with limited access to one such as the rural population, but also allows the therapist to observe the nonverbal aspects of the client and potentially gauge the progress of the client more effectively.

#### 1.1.5. Internet Therapy Research

Typically, there are a number of steps required to validate a style or type of therapy. The therapy needs to be compared to a waitlist control (WLC) group or a treatment control group, to show if the treatment can have a greater impact than either no treatment or minimal treatment, and if treatment gains can be explained by more than spontaneous remission or a placebo effect respectively. Once the treatment has been established as significantly more effective than WLC groups, the protocol is to compare the treatment to other available and validated treatments. Hence, to validate IT as an acceptable mode of psychological treatment, the first step is to compare it to a WLC or an equivalent. The next step would perhaps be to compare it to other forms of therapy, particularly the most commonly used method, FTF. Such a direct comparison would provide important information regarding whether IT is more effective, less effective, or as effective as FTF therapy. Additionally, such a comparison could also indicate whether or not a well-established treatment program can be directly transferred from being administered FTF to being applied over the Internet.

Bailey, Yager, & Jenson (2002) described case studies that either directly or indirectly involved the Internet. One case discussed the use of emailing as an

adjunct to FTF therapy for anorexia nervosa. The client described the experience as mostly positive, due to more regular contact with the therapist, as well as being encouraged and made to reflect. The negative components described by the client in the case study were that it sometimes felt like a chore, and she did not particularly enjoy reflecting and reporting on the negative or unhelpful things she had recently done.

Yager (2001; 2003a; 2003b) reported on additional case studies focusing primarily on using email as an adjunct to the FTF treatment of anorexia nervosa. There are a number of uses for email that are reported; for example, for reporting daily caloric intake, for additional contact between FTF sessions, and for follow-up information to be obtained. Overall, this method is described as positive by both the therapist and the clients.

There has been a recent explosion in empirical research testing the efficacy of IT. Recent serials have dedicated entire publications to the research of IT (e.g., *InPsych*, 2006, *Clinical Psychologist*, 2006). However, the majority of IT research has focused primarily on reducing the amount of therapist-time that individual clients consume. That is, testing whether it is effective to use Internet-based computer programs that require an occasional email from the therapist to the client and vice-versa. Currently there is research being conducted on Internet-based therapy using CBT (e.g., Kenardy et al., 2003) as well as positive psychology (Seligman, Steen, Park, & Peterson, 2005). Such research is

valuable to the progress of IT in a number of ways, as it tests whether treatment can be applied over the Internet effectively, and whether remission can be achieved by replacing traditional therapies with less therapist-intensive styles of therapy that employ technologies such as the Internet.

Kenardy and colleagues (e.g., Kenardy, Dow, Johnston, Newman, Thomson, & Taylor, 2003; Kenardy, McCafferty, Rosa, 2003) have carried out extensive research into the use of the Internet to treat anxiety disorders and anxiety sensitivities. The research initially studied the benefits of treating anxiety, and panic disorder in particular, with a computer-program that was accessed from a palm-top computer (Newman, Kenardy, Herman, & Taylor, 1996, 1997). Newman et al. (1997) treated clients diagnosed with panic disorder in one of two ways: either using a manual-based CBT program FTF for 12 sessions (CBT12), or 4 sessions of a manual-based CBT program administered FTF with an additional palmtop computer-assisted program for 8 weeks as an adjunctive treatment (CBT4-CA). Results indicated that the CBT12 condition was significantly more effective on some measures, however these differences were no longer significant at follow-up.

Kenardy, McCafferty, et al. (2003) compared an Internet-delivered prevention program to a 6-week WLC for individuals with a high anxiety sensitivity, which has shown to be a precursor to anxiety disorders. Results indicated that the IT condition overall was significantly more effective than the

WLC. Specifically, the Agoraphobic Cognitions Questionnaire (Chambless, Caputo, Bright & Gallagher, 1984), the Catastrophic Cognitions Questionnaire (Khawaja & Oei, 1992) and the Centre for Epidemiological Studies Depression Scale (Radloff, 1977) improved significantly more in the treatment condition, whereas the Body Sensations Questionnaire (Chambless et al., 1984) and the Anxiety Sensitivity Index (Peterson & Reiss, 1992) showed a non-significant downward trend. These results indicate that CBT programs have the potential to be successfully and efficaciously adapted for administration over the Internet.

Kenardy, Dow, et al. (2003) randomly allocated 186 individuals diagnosed with panic disorder to one of four conditions: 12 x 1-hour FTF sessions of CBT over 12 weeks (CBT12), 6 x 1-hour FTF sessions of CBT over 6 weeks (CBT6), 6 x 1-hourly FTF sessions of CBT with an additional computer-augmented program (CBT6-CA), or a WLC group. Results suggested that all three treatment conditions were significantly more effective at reducing symptoms of panic disorder than the WLC. Additionally, the CBT12 condition was significantly more effective overall than the CBT6 condition. There were no significant differences between CBT6-CA and CBT12, or between CBT6-CA and CBT-6, however scores on CBT6-CA were consistently between CBT6 and CBT12. The effect sizes for each treatment condition were large (CBT6 = 1.51, CBT6-CA = 1.96, and CBT12 = 2.16). Analyses at 6-month follow-up indicated no significant differences between treatment conditions. These results indicate that a computer-assisted CBT program can act as an adjunct treatment for panic

disorder. However, the benefit of using an adjunct computer program to an abbreviated CBT treatment is primarily for more rapid treatment gains, as the abbreviated CBT alone would have the same effect over a longer period, as indicated by the follow-up data.

Carlbring and colleagues (Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001) compared an Internet-based CBT self-help program for people with panic disorder to a WLC. Participants were randomly allocated to either the Internet condition or to the WLC. The Internet-based program included the following modules: information about panic, breathing retraining, cognitive challenging and restructuring, interoceptive exposure, *in vivo* exposure and relapse prevention. The therapists (i.e., the investigators) emailed the participants to encourage and motivate them to continue with the program and to maintain their efforts throughout the program. Results indicated a significant improvement in general anxiety, as well as a significant decrease in the duration, intensity and frequency of panic attacks for those in the Internet condition.

Carlbring and colleagues (Carlbring et al., 2003, 2005; Carlbring, Nilsson-Ihrfelt, et al., 2005) have since extended their research into this style of Internet-based treatment for panic disorder, and have conducted empirical research studies comparing it to a variety of different therapeutic and control/placebo programs. Carlbring et al.'s (2003) study compared IT with applied relaxation, and although symptoms significantly improved in the IT condition, there were no

significant differences between conditions on most measures. However, the investigators reported that participants on average only completed 56% of the self-help manual, which was much longer than the applied relaxation instructions, and suggest that more therapist involvement is required to generate a larger effect size.

The methods that were employed in Carlbring et al's (2001, 2003) Internet programs are considered to be a self-help program, however they were administered over the Internet and used motivational emails sent to the participants from the therapist. As they employed a self-help paradigm, it is therefore important for this type of IT to be compared to other manual-based self-help programs. Richards and colleagues (2003) compared a) an Internet-based program similar to that of Carlbring et al.'s (2001) program to b) providing only panic-related information over the Internet and c) providing a standardised print-based self-help manual sourced from a well-established manual by Barlow & Cerny (1988). Results indicated that both the Internet-based and self-help programs were significantly more effective in reducing panic-related symptoms when compared to the information only condition. Furthermore, the Internet administered condition showed a greater improvement than the printed self-help text, indicating that Internet-based CBT programs for panic disorder with guidance from a mental health professional are more effective than other self-help programs.



Carlbring, Nilsson-Ihrfelt and colleagues (2005) furthered their research and compared their format of IT to “live therapy” (i.e., traditional FTF therapy). Participants were randomly allocated to either the Internet-based self-help condition, or the “live therapy” condition. Internet-based self-help involved individuals receiving a CBT manual over the Internet and working through the program at their own pace. “Live therapy” involved participants receiving traditional manual-based FTF treatment. Both treatment programs consisted of the same content over 10 modules. Analyses indicated that there were no significant differences between groups, with both treatment programs having a large effect size ( $d = 0.80$  for IT, and  $d = 0.93$  for “live therapy”), indicating that the online self-help program used in the study was as effective as traditional FTF therapy for panic disorder. A continuation of this research into the efficacy of IT is important in order to establish what styles of IT are effective in treating and/or helping to prevent various mental illnesses.

Extensive research has been conducted on IT for eating disorders and their prevention. Winzelberg et al. (2000) created a multimodal computer-assisted health education program, Student Bodies, which aimed to decrease body image concerns in female high school and university students. Body image and weight/shape concerns have been shown to be a precursor to the eating disorders bulimia nervosa and anorexia nervosa (Winzelberg et al., 2000). Student Bodies involved an 8-week structured program conducted over the Internet with little input from the investigators. The content consists primarily of

psychoeducation and cognitive behavioural methods for increasing body satisfaction. Participants in the Student Bodies research were also required to post messages on a communal website for other participants to read and respond to. Hence, Student Bodies was multimodal in that it was both an Internet-based computer program as well as an asynchronous Internet support group. Winzelberg et al. (2000) compared the Student Bodies program to a WLC (delayed intervention) group. Results indicated that participants in the treatment condition showed a significant decrease in drive for thinness and a significant improvement in body image.

Further research into the Internet-based program Student Bodies compared it to a program delivered FTF in the classroom, named Body Traps (Celio, et al., 2000). Body Traps involved an investigator running weekly 2-hour discussion groups over 8 weeks. Body Traps differed from Student Bodies in that it was delivered FTF rather than over the Internet, was synchronous, required an investigator to deliver the intervention, and did not focus on cognitive-behavioural methods of weight regulation or improving body image. Results indicated no significant differences between Student Bodies or Body Traps, indicating that treatments administered over the Internet are as effective as those administered FTF. However, such an inference is made difficult by the fact that the Student Bodies program was not directly transferred into a FTF program, but rather the Body Traps content was different than that of Student Bodies. An important distinction in the IT research is whether an established

FTF program can be administered over the Internet, or whether it needs to be adjusted.

Therefore Zabinski, Celio, Jacobs, Manwaring & Wilfley (2003) adapted the Student Bodies program to a synchronous Internet chatroom treatment. The synchronous IT treatment involved the Student Bodies information and message-boards, as well as a weekly group chat session, where participants had the opportunity to ask questions and make comments about the material they had been reading about. The paper does not specify the number of participants in a typical chat session, however it involved two or more girls and the chat moderator, who would direct the session and answer any questions the participants had. Initially, a pilot study was conducted to test the feasibility of such a medium for treatment. The pilot study involved four female college students who admitted to wanting increased body satisfaction. The effect sizes for reducing eating disorder pathologies such as body image concerns were small to medium.

Henceforth, two additional controlled trials were conducted to test the efficacy of a multimodal IT that included synchronous IT compared to a WLC (delayed intervention). Zabinski et al. (2003) described the findings as positive, however the data are not explicitly reported. Interestingly, 93% of participants in the treatment group said that they preferred the chatroom discussions to posting messages on the message board. Also, the investigators reported significant

reductions on several subscales of the Eating Disorders Examination-Questionnaire (Fairburn & Cooper, 1993). Overall, results from the treatment group indicated a medium effect size from pre-treatment to post-treatment, and a medium to large effect size from pre-treatment to the 10-week follow-up. As the results were not formally presented in this paper, it is difficult to appreciate the intricacies of the effects and the outcomes of this particular research study. Furthermore, the Student Bodies research appears to employ many forms of IT, including programs administered over the Internet, asynchronous IT and synchronous IT. Therefore it is difficult to identify the effect each of these individual components had on the results. However, the reports by the authors are promising, and it is necessary to conduct further research into synchronous IT administered independently from the other formats of IT.

Research into IT has reported conflicting data with respect to attrition rates. Some research has indicated that IT has an attrition rate less than FTF (Celio, Winzelberg, Dev, & Taylor, 2002; Celio, et al., 2000). An improvement in IT attrition rates as compared to FTF treatment may be accounted for by the convenience of IT. Another explanation may be the reminders provided by the investigators for participants in the IT treatment groups in some studies (e.g., Clarke, et al., 2005).

Other studies have found that IT has a higher dropout rate than expected, i.e., higher than that reported in FTF literature (Richards, et al., 2003; Strom,

Pettersson, & Andersson, 2000). There have been a number of suggested reasons to account for this. The first reason offered is that technical difficulties are common, such as the computer spontaneously disconnecting from the Internet and slow Internet connection speeds.

Another reported problem, particularly in the private chatroom style of IT, is the time delay between the therapist typing a sentence, sending it, the client receiving it, thinking of a response, typing the response, sending it, and then the therapist receiving it. Hence IT is potentially not as engaging as FTF therapy simply due to the speed. Such frustrations with time delays can be alleviated in asynchronous IT by the therapist informing the client ahead of time what his/her schedule for responding is likely to be. Therefore, the client knows that a response can be expected at a particular time, so that s/he may not spend excessive amounts of time futilely checking his/her e-mail for a response.

An additional explanation for a higher dropout rate in IT than FTF is that rapport may be difficult to establish in a setting that does not involve FTF interactions. Cook and Doyle (2002) compared results on the Working Alliance Inventory (WAI) of individuals receiving IT (either via asynchronous email or synchronous chatroom) to the original sample used to normalize the WAI who were given FTF treatment. Results indicated that there were no significant differences between FTF and IT on most subscales, and on some subscales IT had significantly better scores than the FTF condition. However, there are some

components of this empirical study that require consideration. For example, there was no standard method of delivering treatment, the researchers did not collect the comparison data (i.e., the FTF data), and therefore the treating therapists were different in each condition. Although this research indicates that therapeutic alliance can be developed over the Internet as well as or better than in FTF, further research is required to confirm and consolidate these findings.

## 1.2. Panic Disorder

### 1.2.1. Definitions

Panic disorder is a well researched disorder described in the Diagnostic and Statistical Manual of Mental Disorders – Fourth Revision (DSM-IV) as recurrent and unexpected panic attacks resulting in significant behavioural change as a result of the panic attacks, worry about the consequences of a panic attack (e.g., “I will lose control”, “I will have a heart attack”, etc) and/or a persistent concern about having another attack (American Psychiatric Association, 2003, see Table 1). A panic attack is described as a distinct period of intense fear and/or discomfort, involving a number of symptoms (e.g., palpitations, sweating, trembling, shortness of breath, nausea, dizziness, etc) that develop suddenly and reach a peak within 10 minutes (see Table 2). Panic disorder can occur with or without the presence of agoraphobia, which is described as anxiety about being in situations or places where escape may be difficult, or where help may not be easily attained in the case of a panic attack; hence such situations or places are avoided or endured with marked distress (see Table 3).

Table 1

DSM-IV diagnostic criteria for panic disorder without agoraphobia (American Psychiatric Association, 2000)

“A. Both (1) and (2):

(1) recurrent unexpected panic attacks (see Table 2)

(2) at least one of the attacks has been followed by 1 month (or more) of one (or more) of the following:

- (a) persistent concern about having additional attacks
- (b) worry about the implications of the attack or its consequences (e.g., losing control, having a heart attack, “going crazy”)
- (c) a significant change in behaviour related to the attacks

B. Absence of agoraphobia (see Table 3).

C. The panic attacks are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hyperthyroidism).

D. The panic attacks are not better accounted for by another mental disorder, such as social phobia (e.g., occurring on exposure to feared social situations), specific phobia (e.g., on exposure to a specific phobic situation), obsessive-compulsive disorder (e.g., on exposure to dirt in someone with an obsession about contamination), posttraumatic stress disorder (e.g., in response to stimuli associated with a severe stressor), or separation anxiety disorder (e.g., in response to being away from home or close relatives).”



Table 2

DSM-IV criteria for a panic attack (American Psychiatric Association, 2000)

“A discrete period of intense fear or discomfort, in which four (or more) of the following symptoms developed abruptly and reached a peak within 10 minutes:

- (1) palpitations, pounding heart, or accelerated heart rate
- (2) sweating
- (3) trembling or shaking
- (4) sensations of shortness of breath or smothering
- (5) feeling of choking
- (6) chest pain or discomfort
- (7) nausea or abdominal distress
- (8) feeling dizzy, unsteady, lightheaded, or faint
- (9) derealization (feelings of unreality) or depersonalization (being detached from oneself)
- (10) fear of losing control or going crazy
- (11) fear of dying
- (12) paresthesias (numbness or tingling sensations)
- (13) chills or hot flushes”

The DSM-IV criteria for panic disorder with agoraphobia are the same as in Table 1, however part B is changed to “presence of agoraphobia” (see Table 3

for criteria for agoraphobia).

### Table 3

#### DSM-IV Criteria for agoraphobia (American Psychiatric Association, 2000)

A. "Anxiety about being in places or situations from which escape might be difficult (or embarrassing) or in which help may not be available in the event of having an unexpected or situationally predisposed panic attack or panic-like symptoms. Agoraphobic fears typically involve characteristic clusters of situations that include being outside the home alone; being in a crowd or standing in a line; being on a bridge; and traveling in a bus, train, or automobile. Note: Consider the diagnosis of specific phobia if the avoidance is limited to one or only a few specific situations, or social phobia if the avoidance is limited to social situations.

B. The situations are avoided (e.g., travel is restricted) or else are endured with marked distress or with anxiety about having a panic attack or panic-like symptoms, or require the presence of a companion.

C. The anxiety or phobic avoidance is not better accounted for by another mental disorder, such as social phobia (e.g., avoidance limited to social situations because of fear of embarrassment), specific phobia (e.g., avoidance limited to a single situation like elevators), obsessive-compulsive disorder (e.g., avoidance of dirt in someone with an obsession

about contamination), posttraumatic stress disorder (e.g., avoidance of stimuli associated with a severe stressor), or separation anxiety disorder (e.g., avoidance of leaving home or relatives).

### 1.2.2. Prevalence

A number of surveys have shown the incidence of panic disorder to be fairly consistent in Western countries. Studies in the United States of America estimated the incidence of panic disorder to be around 2.5-5% (Grant et. al, 2006; Weissman & Merikangas, 1986). Australian estimates of the incidence of panic disorder are around 2.4-3.8% (Andrews, Hall, Teeson, & Henderson, 1999; Weissman, et al., 1997). Similarly, Carlbring and colleagues (2001) estimate the incidence in a large randomly selected Swedish community sample to be 2.2%. Overall, research has shown that the lifetime prevalence of panic disorder is between 1-3.5%, and that 10% of people referred for mental health assistance meet the criteria for panic disorder. In vestibular, respiratory and neurology clinics the presence of panic disorder can rise to between 10-30%, and in cardiology clinics has been found to be as high as 60%. Within the community, between 33-50% of people with panic disorder have agoraphobia, however this percentage is higher in clinical samples. Whilst gender rates are about even for those with panic disorder without agoraphobia, this is not the case for panic disorder with agoraphobia, of which there are about 3 times more women than men (Royal Australian and New Zealand College of Psychiatrists, 2003).

With respect to the genetic component of panic disorder, twin studies have suggested that there is a significant genetic effect (Hettema, Neale, & Kendler, 2001). Also, research has shown that first-degree biological relatives of individuals with panic disorder are about 8 times more likely to develop panic attacks, or anxiety sensitivity, which is shown to be a precursor to anxiety disorders (van Beek & Griez, 2003). However, if an individual develops panic disorder prior to the age of 20 years, first-degree relatives are up to 20 times more likely to develop panic disorder than the normal population. Naturalistic follow-up studies have shown that at 6-10 years after receiving treatment at a tertiary care setting for panic disorder, around 30% of the treated population were functioning well, 40-50% of individuals improved but still remained partially symptomatic, and the remaining 20-30% continued to have symptoms that are the same or worse than at the time of treatment (Roy-Byrne & Cowley, 1995). Such an alarming prevalence rate has been the primary motivating factor for the widespread research into the treatment of panic disorder both with and without agoraphobia.

### 1.2.3. Research and Treatment

Panic disorder is possibly the most thoroughly researched psychological disorder known to mankind. Research has shown the most efficacious psychological treatment of panic disorder to be CBT (Craske, Brown, & Barlow, 1991; Margraf, Barlow, Clark, & Telch, 1993). Results from several meta-analyses indicate that CBT is the superior treatment, being more efficacious than

other psychological and/or pharmaceutical treatments (Gould, Otto & Pollack, 1995; Royal Australian and New Zealand College of Psychiatrists, 2003). Gould et al. (1995) conducted a meta-analysis that compared the effectiveness of cognitive-behavioural treatments for panic disorder with pharmacological treatments as well as a combination of both CBT and pharmacotherapy. Results showed that CBT had the highest effect size ( $=0.68$ ), compared with combined treatment ( $=0.56$ ) and pharmacotherapy only ( $=0.47$ ). Within the CBT treatments, those that involved both cognitive restructuring as well as interoceptive exposure showed the largest effect sizes ( $=0.88$ ). In addition to this, CBT showed significantly lower attrition rates compared to pharmacotherapy. Finally, analyses indicated that CBT was more effective over the long-term, that is, it had a much lower rate of relapse.

Craske et al. (1991) demonstrated the long-term effectiveness of treatments involving cognitive restructuring and interoceptive exposure. This seminal research study compared CBT (including cognitive restructuring and interoceptive exposure), progressive muscle relaxation (PMR) and a combination of both treatments, with assessments at 6- and 24-months after the cessation of treatment. Results indicated that CBT was significantly more effective than PMR at reducing panic attacks at each assessment following treatment. Also, individuals in the CBT condition generally continued to improve over the 24-month follow-up period, whereas those in the PMR condition did not. Such results indicate that CBT equips individuals with the necessary skills and

techniques necessary to reduce and ultimately cease their panic attacks. PMR, however, may simply decrease the individuals' level of overall anxiety for the period in which they are receiving the treatment, yet offering little to no long-term benefits.

The Royal Australian and New Zealand College of Psychiatrists (2003) state that effective treatment has the following goals: "(i) control and cessation of panic attacks; (ii) control and cessation of fear-driven avoidance; and (iii) reduction in vulnerability to relapse" (p. 644). The aforementioned research conducted by Craske et al. (1991) showed that PMR does not reliably fulfil any of the above goals, but in particular the third goal. Whilst CBT has been shown to achieve these three goals, research indicates that pharmacotherapy for panic disorder is successful in achieving only the first two, as shown in the meta-analyses conducted by Gould et al. (1995). That is, drug treatments do not reduce the vulnerability to relapse once an individual ceases taking the medication.

Research carried out by Clark, et al. (1994) supports the notion that pharmacotherapy has a higher level of relapse as compared to cognitive-behavioural treatments. Clark et al. (1995) conducted a randomised control trial which compared the following treatments for panic disorder: cognitive therapy, applied relaxation, a drug trial of imipramine, and a WLC group. Post-treatment analyses indicated that all three treatments were significantly more effective than

the WLC condition. At the three-month follow-up, results showed that cognitive therapy was more effective than applied relaxation and imipramine. However, at the 6-month follow-up, there were no significant differences between cognitive therapy and imipramine, but both were more effective than applied relaxation. Furthermore, over the next eight months, several individuals in the imipramine condition relapsed, so that at the 15-month follow-up, cognitive therapy was once again superior to both imipramine and applied relaxation. The lengthy follow-up period included in Clark et al.'s (1991) research allowed vital information to be collected regarding the long-term effects of each treatment, rather than simply the immediate effects that are commonly reported.

The abundance of research into CBT for panic disorder has shown that an efficacious treatment for panic disorder involves the following components: psychoeducation, panic monitoring, breathing retraining, cognitive challenging and restructuring, exposure to feared sensations (interoceptive exposure), exposure to feared situations (*in vivo* exposure), and relapse prevention (Barlow, 2001).

Psychoeducation is a vital part of treatment for panic disorder. Often individuals with panic disorder think that they are having a heart attack or a stroke when they experience a panic attack. Therefore it is essential that the nature of panic and anxiety is explained so that they understand at a physiological level what is happening when they experience these sensations

such as a racing heart and tingling.

The efficacy of breathing retraining is currently being debated in the literature. Some research has shown that CBT without breathing retraining is as effective as a CBT program that includes breathing retraining, whereas other research has shown that breathing retraining alone is as effective as CBT (Berger, 2001). However, the majority of treatment-outcome studies on CBT for panic disorder have included breathing retraining, and many clients have commented on the benefits of this component. People with panic disorder often have an elevated basal breathing rate, making them more prone to hyperventilation (Berger, 2001). Breathing retraining aims to teach the client how to breathe deeply and slowly, hence reducing their overall breathing rate to a normal and healthy range. It is important for this message to be conveyed clearly to the client, as there is a risk that the client uses slow-breathing as a method to stop a panic attack. Using breathing retraining in this way may lead to slow-breathing techniques becoming a safety behaviour for the client. Hence breathing retraining should be employed simply to reduce overall breath rates, and more helpful methods should be utilised for reducing panic attacks such as cognitive challenging (see below).

Cognitive challenging and restructuring is an essential component of CBT (Barlow, 2001; Hedley, Hoffart & Sexton, 2001). It involves providing the client with a rationale for cognitive therapy, followed by monitoring the client's unhelpful



thoughts, challenging those unhelpful thoughts, and finally restructuring them (that is, replacing them with more helpful and realistic thoughts). Cognitive therapy is based on the research showing that thoughts significantly influence our feelings and behaviours (Ottaviani & Beck, 1987). Hence, challenging and replacing the unhelpful thoughts that trigger and maintain panic attacks can ideally lead to a significant reduction in the severity, duration and frequency of panic attacks (Marks, Basoglu, & Noshirvani, 1995).

Those with panic disorder often avoid situations or events that have triggered a panic attack in the past, or may potentially trigger one in the future (for example, large crowds, shopping centres, tunnels, public transport, etc). Hence it is important that individuals with panic disorder are gradually exposed to these situations or events where they can practice their newly acquired cognitive challenging and restructuring skills (Clark, 1994).

Individuals with panic disorder also fear the physical sensations caused by anxiety, and hence avoid activities that may cause similar physical sensations (for example, exercise, scary movies, rollercoasters, etc). Such individuals are extremely sensitive to these physical sensations. Interoceptive exposure creates these physical sensations in a controlled environment, which allows clients to desensitise themselves to these sensations (Clark, 1994). Interoceptive exercises include hyperventilating, spinning, exercising (jumping up and down), and breathing through a straw.

Relapse prevention is the final stage of therapy and it involves reflecting on the completed treatment program and problem-solving for possible future triggers of anxiety and panic (Barlow, 2001).

An established and publicly available panic disorder treatment program with the aforementioned components can be found at the Clinical Research Unit for Anxiety and Depression's (CRUfAD's) website, [www.crufad.com](http://www.crufad.com), a branch of the University of New South Wales' School of Psychiatry.

### 1.3. The Current Study

Administering and receiving psychological treatment over the Internet is now being conducted in a number of forms, e.g., synchronous and asynchronous, therapist-mediated and self-help, group and one-on-one. Research that has aimed to decrease time-demands placed on therapists has shown that self-help manuals can be successfully developed for access over the Internet to provide an effective and time-efficient treatment program. However, such research has also indicated that an IT program with increased therapist-involvement is often more effective. Therefore, whilst research into asynchronous IT is important and valuable, synchronous IT remains relatively unresearched. Research into synchronous IT is extremely important, as it has implications for Australia's rural population, as well as other populations who have extremely limited access to mental health professionals. Such research would provide insight into whether an established FTF and therapist-mediated treatment manual can be directly administered over the Internet. Also, such research would provide a guide as to whether synchronous IT can be used instead of, or alongside FTF therapy, which would increase access to mental health professionals for rural populations, as well as minimise the cost to the government to provide this help.

Therefore, the current study aims to test the efficacy of synchronous one-on-one IT for panic disorder (with and without agoraphobia) and compare it to traditional FTF therapy. Using a reputable, publicly available treatment manual

(available at [www.crufad.com](http://www.crufad.com)) this study will offer a well-researched treatment program for panic disorder and administer the same treatment either over the Internet or FTF. Hence, results will allow the efficacy of IT as a whole to be compared to that of FTF. Additionally, the results of individual subcomponents of treatment can be directly compared, such as cognitive therapy, interoceptive exposure and graded exposure. Such results will indicate which, if any, components can successfully and efficaciously be administered over the Internet, and which components require traditional FTF therapy. It is hypothesised that FTF therapy will significantly decrease panic symptomatology, however it is unknown how IT will perform as a sole treatment and with respect to FTF.

## 2. Method

### 2.1 Design

Following recruitment, all participants were given a one-on-one psychological assessment, which involved administering a FTF semi-structured diagnostic interview, as well as a number of psychometric questionnaires. If participants met the inclusion criteria they were randomly assigned to one of two treatment conditions: (a) CBT administered FTF or (b) CBT administered over the Internet. Data were collected at pre-, mid-, post-, and follow-up treatment, which were following the initial assessment, session 3, session 6, and session 7 respectively (see Table 4 for program structure). Data were analysed in a mixed model design with three between-group factors. Participants in the FTF therapy condition attended the University of Sydney Psychology Clinic for each session. Those in the IT condition received their treatment over the Internet at a location of their choice (most commonly at their residence).

Table 4

#### Structure of the Treatment Program

Week	1	2	3	4	5	6	7	8-10	11
Session		1	2	3	4	5	6		7
Assessment	Pre			Mid			Post*		Follow-up**

\* Working Alliance Inventory administered in addition to test battery

\*\* Qualitative Questionnaire administered in addition to test battery (IT only)

## 2.2. Participants

Participants were 30 patients diagnosed with panic disorder (with or without agoraphobia) who were given treatment free of charge in exchange for their participation. Patients were diagnosed using a semi-structured interview and according to the criteria outlined in the Diagnostic and Statistical Manual –IV (DSM-IV; American Psychiatric Association, 2000). Comorbidities were also assessed and identified in the semi-structured interview and diagnosed according to the DSM-IV criteria (American Psychiatric Association, 2000). Several instruments were used to confirm the diagnosis of panic disorder with or without agoraphobia: Depression Anxiety Stress Scales (DASS), Agoraphobic Cognitions Questionnaire (ACQ), Body Sensations Questionnaire (BSQ), and the Mobility Inventory (MI) (see section 2.3.2. for more details). There were three avenues through which participants were recruited: They were either referred from their general practitioners (see Appendix A for recruitment letter), or from the CRUfAD waiting list, or presented to the University of Sydney Psychology Clinic for treatment for panic disorder.

With respect to inclusion and exclusion criteria, all participants were required to be 18 years or over and have access to the Internet on any computer for at least one hour per week. Participants had to be fluent in English so that an interpreter was not required at any stage of the program. Participants were required to meet the criteria for a primary diagnosis of panic disorder with or without agoraphobia according to the DSM-IV (American Psychiatric Association,

2000). Exclusion criteria included a history of psychosis, a current major depressive episode, current substance abuse or current suicidal ideation.

Participants consisted of 8 males and 22 females with an age range of 18-65 years and a mean age of 32.40 years ( $SD = 13.00$ ). Seventeen participants met the diagnostic criteria for agoraphobia, and thirteen participants did not. The number of months since the onset of the participants' current episode of panic disorder ranged between 2-120 months, with a mean of 20.70 months ( $SD = 29.26$ ). Ten participants reported having at least one previous episode of panic disorder. Fifteen participants (5 males and 10 females; 7 with agoraphobia and 8 without agoraphobia) were allocated to the FTF condition, and 15 participants (3 males and 12 females; 10 with agoraphobia and 5 without agoraphobia) were allocated to the IT condition. Of these 30 participants, 21 completed treatment (13 FTF and 8 IT). Of the remaining 9, 2 FTF participants failed to complete treatment and were no longer contactable after the fourth and sixth sessions respectively. Of the remaining 7 participants from the IT condition, 4 discontinued as they had sought other treatment (three after the first session, and one after the third session), 2 were no longer contactable (following the first and third sessions respectively) and one was referred to a more appropriate service for more intensive treatment for a mood related disorder.

### 2.3. Materials and Apparatus

#### 2.3.1. Treatment manual

Participants were provided with a 64-page treatment manual entitled

Cognitive-Behaviour Therapy for Panic Disorder. The treatment manual was based on CRUFAD's manual for panic disorder, which is publicly available on the CRUFAD website ([www.crufad.com](http://www.crufad.com)). However, it was tailored to the needs of the current project (see Appendix B). The manual was adapted from a group therapy format so that it could be administered in individual therapy, both FTF and over the Internet over seven weeks. The changes were minor and consisted primarily of adaptations to the suggested exercises so that they were in individual format rather than group. The manual was divided up into eight sections, one for each week of the treatment program, plus one section to be read during the 4-week post-treatment period between sessions 6 and 7 (see Table 4).

### 2.3.2. Measures

The initial semi-structured interview was designed by the University of Sydney Psychology Clinic to screen clients. As panic disorder with agoraphobia is made up of several succinct components, research generally requires several different assessment measures to provide an overall picture of an individual's symptomatology (e.g., Hahlweg, Fiegenbaum, Frank, Schroeder & von Witzleben, 2001). The assessment measures used were the Depression, Anxiety and Stress Scales (DASS-42; Lovibond & Lovibond, 1995), Agoraphobic Cognitions Questionnaire (ACQ; Chambless et al., 1984), Body Sensations Questionnaire (BSQ; Chambless et al., 1984), Mobility Inventory (MI; Chambless, Caputo, Jasin, Gracely, & Williams, 1985) and the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989). Also, a qualitative questionnaire was



developed to obtain insight into the IT participants' experiences of IT (see Appendix C for measures).

2.3.2.1. Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995). The DASS is used to measure three constructs: depression, anxiety, and stress. It has been shown to have adequate psychometric properties. When compared to the internationally recognised scales of anxiety and depression, the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI), the DASS correlated 0.81 and 0.74 respectively. The lower correlation for depression is probably due to the BDI's emphasis on affective symptoms of depression that often occur in other affective states, whereas the DASS-Depression items focus mainly on depressive thoughts and feelings. The DASS showed a greater distinction between anxiety and depression than did the combined use of the BAI (Beck & Steer, 1993) and the BDI (Beck, Steer & Brown, 1996), indicating that the DASS can distinguish between the two constructs more accurately. The DASS has been shown to have excellent reliability, and adequate convergent and discriminant validity (Crawford & Henry, 2003). An Australian population was used as its normalisation sample, similar to that of the current study. The DASS is a popular measure used widespread in Australian and international psychological research in mood and anxiety (e.g., Carty, 2001; Gallart & Matthey, 2005).

2.3.2.2. The Agoraphobic Cognitions Questionnaire (ACQ; Chambless et. al, 1984). The ACQ consists of 14 statements that are common thoughts for people with panic disorder. The 14 statements consist of 2 seven-item factors measuring thoughts a) that anxiety symptoms are misinterpreted as physical disaster (e.g., “I will have a heart attack”) and b) that there will be a loss of control resulting in mental, behavioural or social catastrophe (e.g., “I am going to go crazy”). Each item is rated on a scale of 1-5 as to how often this thought occurs (never = 1, almost always = 5). The psychometric properties of the ACQ have been supported in a number of papers (e.g., Chambless & Gracely, 1988; 1989; Clark et al, 1995; 1997). The internal consistency of the ACQ has been demonstrated (alpha = 0.80), as has the test-retest reliability over a 1-month period (test-retest  $r = 0.86$ ). Analyses have also shown the construct validity to be satisfactory. The ACQ has been used in a plethora of treatment-outcome studies for panic disorder (e.g., Chambless, Beck, Gracely & Grisham, 2000; Fleming & Faulk, 1989; Harcourt, Kirkby, Daniels & Montgomery, 1998).

2.3.2.3. The Body Sensations Questionnaire (BSQ; Chambless et. al, 1984). The BSQ is a measure of the anxiety or fear individuals have regarding physical sensations typically associated with panic (e.g., light-headedness). The scale consists of 17 items, which the client must rate from 1-5 how frightened or worried s/he is by each sensation (1 = not at all worried or frightened, – 5 = extremely worried or frightened by this sensation). The BSQ is frequently used in conjunction with the ACQ to provide a comprehensive insight into both the

physical and cognitive aspects of an individual's panic attacks. The BSQ has been shown to have good reliability over a 1-month period (test-retest  $r = 0.67$ ) and has been shown to have high internal consistency ( $\alpha = 0.88$ ). The construct validity of the BSQ has been demonstrated repeatedly (e.g., Arrindell, 1993a, 1993b; Chambless et al., 1984; Ehlers & Margraf, 1993). As with the ACQ, the BSQ has been used widely in psychological research (e.g., Carr, Lehrer, Rausch & Hochron, 1994; Uren, Szabo & Lovibond, 2004; Waddell & Demi, 1993).

2.3.2.4. The Mobility Inventory (MI; Chambless et. al, 1985). The MI is a 27-item self-report questionnaire measuring levels of agoraphobic avoidance and frequency and intensity of panic attacks. The participant is required to rate his/her level of avoidance when both alone and accompanied in 26 different situations. Therefore the MI allows important information for both research and clinical purposes. Both the convergent and discriminant validity of the MI have shown to be satisfactory indicating that it is an accurate measure of agoraphobic avoidance behaviours. The convergent validity was measured by correlating the MI scores of individuals diagnosed with agoraphobia both before and after psychological intervention to the respective scores on the Fear Questionnaire Agoraphobia factor (Marks & Mathews, 1979). The discriminant validity was measured by correlating the MI scores to those of the Eysenck Personality Questionnaire Psychoticism factor (Eysenck & Eysenck, 1972). These were shown not to significantly correlate, and therefore are not a measure of the same

construct. As with the aforementioned ACQ and BSQ, the MI is a common tool both in psychological treatment of panic disorder with agoraphobia, as well as the empirical research of this disorder (e.g., Clark et. al, 1994; Schmidt & Koselka, 2000; Waddell & Demi, 1993). The MI also provides a definition of a panic attack, and then asks how many panic attacks have been experienced in the past one week and three weeks. Although the definition of a panic attack does not exactly correspond with the DSM-IV's diagnostic criteria, its construct validity is shown to be high (Chambless et al., 1985). Limited research has been done on the validity of the panic severity measure; however this measure is used as a subjective measure indicative of the impact the panic attacks are having on an individual's daily activities.

#### 2.3.2.5. Working Alliance Inventory (WAI; Horvath & Greenberg, 1989).

The WAI is a self-report measure of the quality of therapeutic alliance. The WAI involves two forms: the Client form and the Clinician form. Each form contains 12 items that are answered on a scale of 1 (= Does not correspond at all) to 7 (= Corresponds exactly). The WAI has adequate reliability, shown to be .93 (Client form) and .87 (Clinician form). Scores on the WAI have been shown to correlate with other inventories measuring similar traits, showing that it has convergent validity. WAI scores have also been shown to be a significantly better predictor of psychological treatment outcomes compared to other relationship measures. The WAI measures three different constructs: bonds, goals and tasks. Scores on these three constructs have shown to correlate, hence indicating that they may

overlap in what they are measuring. Hence, the current project only considered the overall WAI score. The WAI has been used in many psychological studies examining therapeutic alliance (e.g., Davis & Lysaker, 2004; Reis & Grenyer, 2004; Woody & Adessky, 2002).

2.3.2.6. Qualitative Measure of Participants' Experience of Internet Therapy. A final measure was designed for the purpose of the current study to obtain qualitative information about the IT participants' attitudes towards the IT experience. The questions were both closed and open-ended to elicit specific information and medium-length responses respectively (i.e., up to three sentences; see Appendix C for details). The questions were designed to obtain information on the participants' view of the advantages and disadvantages of IT, problems they faced due to IT, and how the IT process could be improved.

2.3.2.7. Internet Therapy. To execute IT, the investigator used a desktop computer that had broadband access to the Internet, and the client required either dial-up or broadband access to a computer with the Internet. The Making Changes website ([www.makingchanges.com.au](http://www.makingchanges.com.au)) was used for the IT condition, and involved a synchronous and private one-on-one chat-room (see Figure 1). The website was responsible for encrypting all information sent and received throughout each session, which ensured confidentiality. Additionally, access to each session was gained using a password, which only the investigator and the participant had.

## 2.4. Procedure

When participants contacted the project coordinator, they were asked several questions about the nature of their symptoms, as well as whether or not they had access to the Internet. The study was briefly explained and a time was made for a FTF initial interview.

2.4.1. Initial assessment. At the initial interview, the investigator outlined the details of the program. Participants were told that the program was investigating the efficacy of IT on treating panic disorder. They were then given the Participant Information Sheet and Consent Form to read and if they agreed to participate in the study, were asked to complete it (see Appendix D). A semi-structured interview was then conducted to determine whether the participant met the criteria for panic disorder (with or without agoraphobia) according to the DSM-IV (American Psychiatric Association, 2000). Participants were then asked to complete the pre-treatment questionnaires consisting of the DASS, ACQ, BSQ and MI. Participants were then given a sheet of instructions on how to access the IT website, and asked to follow these instructions using the computer in the interview room. Once it was established that the participant met the criteria for participating in the study, he or she was randomly assigned to either the FTF or IT condition, using a number randomisation computer program (accessed online at [www.randomizer.com](http://www.randomizer.com)). All those participants assigned to a condition

commenced the program. Participants in the IT condition were given a username and password for the Making Changes website. Finally, participants were given the first chapter of the treatment manual and asked to read it prior to the first session, which was then scheduled.

2.4.2. Providing Face-to-face Therapy. Participants in the FTF condition attended the University of Sydney Psychology Clinic for every one-hour session each week. Following each session, participants were issued with the next chapter of the treatment manual, and asked to read it prior to the following session. Each session involved administering manual-based CBT and generally entailed: a review of the homework tasks, review of the participant's week, any questions from the previous week or from the readings, a summary of the readings, and completing the set exercises for the session. Following sessions 3, 6 and 7, participants were asked to complete the treatment measures, at which time the investigator left the room and returned when the participant had finished the task.

2.4.3. Providing Internet Therapy. Participants in the IT condition were required to log onto the Making Changes website at the scheduled time each week. If the participant could not attend the session at the arranged time, s/he was requested to email the investigator, or if this was not possible, to telephone the University of Sydney Psychology Clinic and leave a message. Participants mostly used their personal computer at home for the purpose of IT, however one

participant used a neighbour's computer, one participant accessed the Internet at the local library, and one participant accessed the Internet from her place of employment.

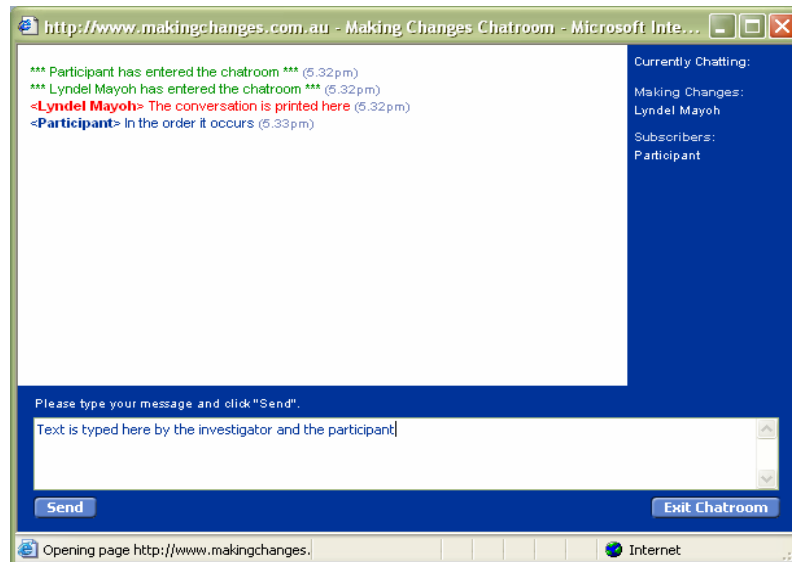
The treatment chapters were posted to the participant separately, and were sent 10 days prior to the respective session, to allow the participant a full week to read the material. Essentially the treatment provided was identical to that offered in the FTF therapy described above, but was provided over the Internet using the Making Changes website. The Making Changes therapy website consisted of two windows, a small one and a large one (see Figure 1 for diagram). Both the participant and the investigator could type a number of sentences into their small window and then press the "send" button. Once this button had been pressed, the information was posted in the larger window for both parties to see. Each time information was sent it was posted under the most recently sent information so that the text appeared in chronological order similar to that of a written conversation. The participant's text was written in one colour (e.g., blue) and the investigator's text was written in another colour (e.g., red).

The mid-, post-, and follow-up treatment measures were posted to the IT participants along with the corresponding chapter, and in a stamped and addressed envelope. Following sessions 3, 6 and 7, participants were asked to complete the treatment measures they had received, and to post them as soon



as possible.

Figure 1. Format of the Internet Therapy webpage.



2.4.4. Discharge and referrals. Following the seventh session, participants were discharged from the program. A letter was sent to the participant's nominated general practitioner outlining: the components of the program, the progress made by the participant and further recommendations for the participant where appropriate. If participants requested further treatment, the investigator re-referred them to the University of Sydney Psychology Clinic, or to a more suitable service if required. If the investigator became concerned about the mental state of any of the participants doing the study, or if they required more specialised services, that participant was withdrawn from the programme and treated or referred accordingly.

### 3. Results

As there were a number of measures used in the current study, a conservative alpha was used, which was  $\alpha = .01$ . Effect sizes are provided in the tables using Cohen's  $d$  (Cohen, 1988). "An effect size of 1.0 indicates that the average treated person would be better than 86% of untreated patients" (Royal Australian and New Zealand College of Psychiatrists Clinical Practice Guidelines Team for Panic Disorder and Agoraphobia, 2003, p.645).

#### 3.1.1. Pre-treatment Differences and Attrition Rates

Analyses indicated that there were no significant differences between the IT and FTF groups on any variables measured at the pre-treatment assessment, including sex, age, levels of agoraphobia, chronicity and results on the self-report questionnaires. Nine participants dropped out of treatment, 7 from IT and 2 from FTF. Analyses indicated that those who dropped out of treatment had significantly higher levels of depression than those who remained in treatment. There were no other significant differences between dropouts and completers,  $F(1, 28) = 2.82, p = .009$ .

#### 3.1.2 Face-to-face Therapy

3.1.2.1. Pre-treatment and post-treatment comparisons. A multivariate analysis of variance (MANOVA) between pre-treatment and post-treatment FTF scores yielded a significant main effect, showing that FTF therapy significantly

improved symptoms of panic disorder,  $F(1, 13) = 13.32, p = .003$ . Furthermore, Table 5 shows that only one individual measure did not significantly improve from pre-treatment to post-treatment, which was the number of panic attacks in the week prior to the respective assessments,  $F(1, 13) = 3.70, p = .077$ .

Table 5

Multivariate Analysis of Variance for Pre- and Post-Treatment Comparison for Face-to-face Therapy: Between Subjects Results

Source	Df	F	P	Cohen's d
Depression	1	67.80	.000**	1.50
Anxiety	1	45.55	.000**	1.76
ACQ	1	16.88	.001**	1.15
BSQ	1	30.67	.000**	1.64
MI accompanied	1	11.14	.005*	0.99
MI alone	1	22.88	.000**	1.18
Number of panic attacks (1 week prior)	1	3.70	.077	0.63
Panic severity	1	50.90	.000**	1.96

Note. \* $p < .01$  \*\* $p < .001$

3.1.2.2. Post-treatment and follow-up comparisons. A MANOVA between post treatment and follow-up scores yielded a significant main effect, showing that FTF therapy scores continued to improve after the completion of the

treatment program,  $F(1, 12) = 15.71$ ,  $p = .004$ . Specifically, anxiety scores significantly improved between post-treatment and follow-up,  $F(1, 12) = 16.44$ ,  $p = .002$ .

### 3.1.3. Internet Therapy

3.1.3.1. Pre-treatment and post-treatment comparisons. A MANOVA between pre-treatment and post-treatment IT scores indicated that the main effect was not significant, showing that IT did not significantly improve symptoms of panic disorder overall,  $F(1, 7) = 3.64$ ,  $p = .38$ . However, as shown in Table 6, two measures showed a significant improvement from pre- to post-treatment: BSQ,  $F(1, 7) = 19.83$ ,  $p = .003$ , and the severity of panic attacks,  $F(1, 7) = 19.90$ ,  $p = .003$ . Notably, the change in anxiety scores on the DASS was approaching significance using a conservative alpha of .01,  $F(1, 7) = 9.04$ ,  $p = .02$ .

3.1.3.2. Post-treatment and follow-up comparisons. A MANOVA between post-treatment and follow-up scores did not yield a significant main effect  $F(1, 7) = 1.00$ ,  $p = .65$ . Additionally, there were no significant differences between post-treatment and follow-up scores on all measures used in the analysis.

### 3.1.4. Face-to-face Therapy Versus Internet Therapy

3.1.4.1. Pre-treatment and post-treatment comparisons. A MANOVA was conducted to compare the change in scores from pre-treatment to post-treatment

results from the FTF condition to those from the IT condition. The analysis yielded an overall main effect, meaning that scores significantly improved following treatment,  $F(1, 20) = 8.96, p < .001$ .

Table 6

Multivariate Analysis of Variance for Pre- and Post-Treatment Comparison for Internet Therapy: Between Subjects Results

Source	Df	F	p	Cohen's d
Depression	1	1.81	.221	0.59
Anxiety	1	9.04	.020 <sup>#</sup>	0.75
ACQ	1	3.28	.113	0.53
BSQ	1	19.83	.003*	1.17
MI accompanied	1	.461	.519	0.09
MI alone	1	1.54	.255	0.55
Number of panic attacks (1 week prior)	1	4.07	.083	0.17
Panic severity	1	19.90	.003*	1.07

Note. \* $p < .01$  <sup>#</sup> $p < .05$

Between treatment group comparisons yielded no significant differences overall,  $F(1, 20) = 1.38, p = .291$ . Specifically, results on four measures were approaching significance using a conservative alpha of .01, suggesting that FTF was more effective in reducing scores on the depression and anxiety subscales

of the DASS,  $F(1, 20) = 5.16$ ,  $p = .034$  and  $F(1, 20) = 6.62$ ,  $p = .016$  respectively, the MI-accompanied,  $F(1, 20) = 6.99$ ,  $p = .04$ , and the severity of panic attacks,  $F(1, 20) = 4.78$ ,  $p = .041$ . Table 7 provides the results of the between-groups MANOVA analysis. The analysis yielded an overall main effect, meaning that scores significantly improved following treatment,  $F(1, 20) = 8.96$ ,  $p < .001$ .

Table 7

Multivariate Analysis of Variance for Pre- and Post-Treatment Comparisons of Face-to-face Therapy and Internet Therapy: Between Group Results

Source	df	F	p
Depression	1	5.16	.034 <sup>#</sup>
Anxiety	1	6.61	.016 <sup>#</sup>
ACQ	1	2.90	.164
BSQ	1	1.13	.301
MI accompanied	1	4.85	.040 <sup>#</sup>
MI alone	1	3.04	.096
Number of panic attacks (1 week prior)	1	1.07	.314
Panic severity	1	4.78	.041 <sup>#</sup>

Note. <sup>#</sup> $p < .05$  (approaching significance)

Figure 2 demonstrates the change in scores of the anxiety and depression subscales of the DASS over the course of the treatment program for both FTF

and IT conditions. Figure 3 and Figure 4 represent the change in scores of the ACQ and BSQ, and MI-accompanied and MI-alone respectively over the course of the treatment program for both FTF and IT conditions.

Figure 5 demonstrates the results on self-reported-number of panic attacks in the week prior to the assessment, and the severity of panic attacks for both the FTF and IT conditions.

Figure 2. Changes in Face-to-face Therapy and Internet Therapy Scores of Anxiety and Depression Over Treatment

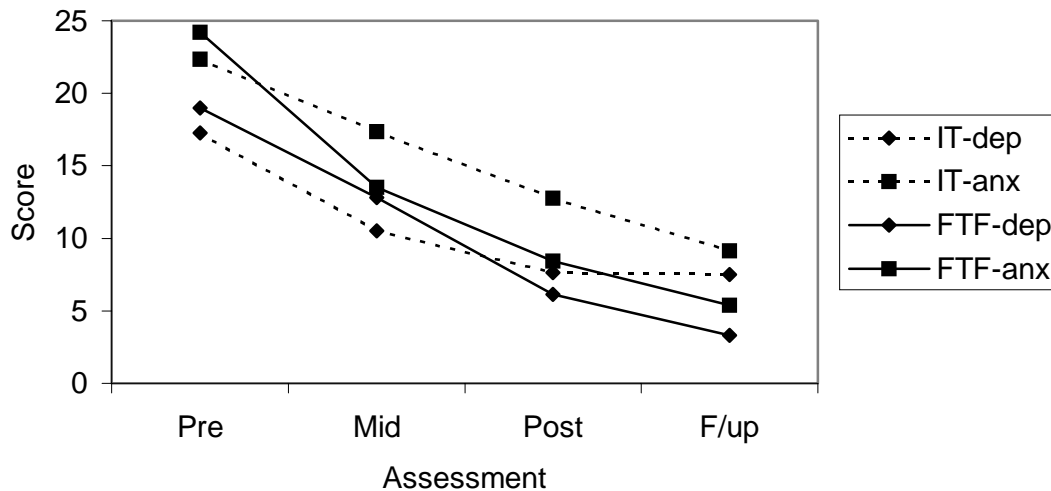


Figure 3. Changes in Face-to-face Therapy and Internet Therapy Scores on the ACQ and BSQ Over Treatment

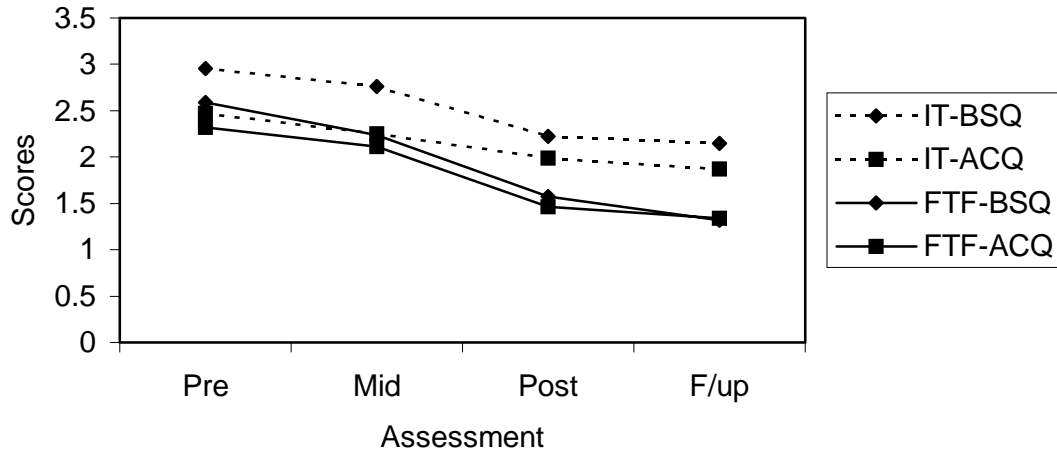


Figure 4. Changes in Face-to-face Therapy and Internet Therapy Scores on the MI (Accompanied and Alone) Over Treatment

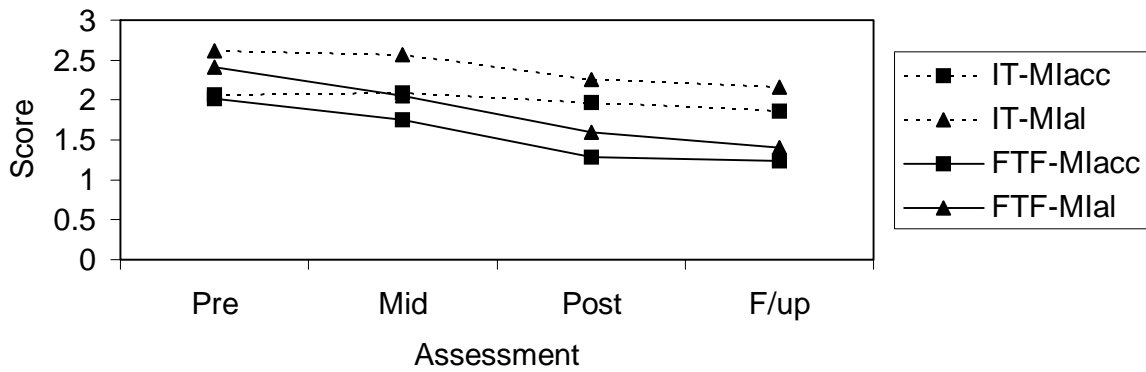
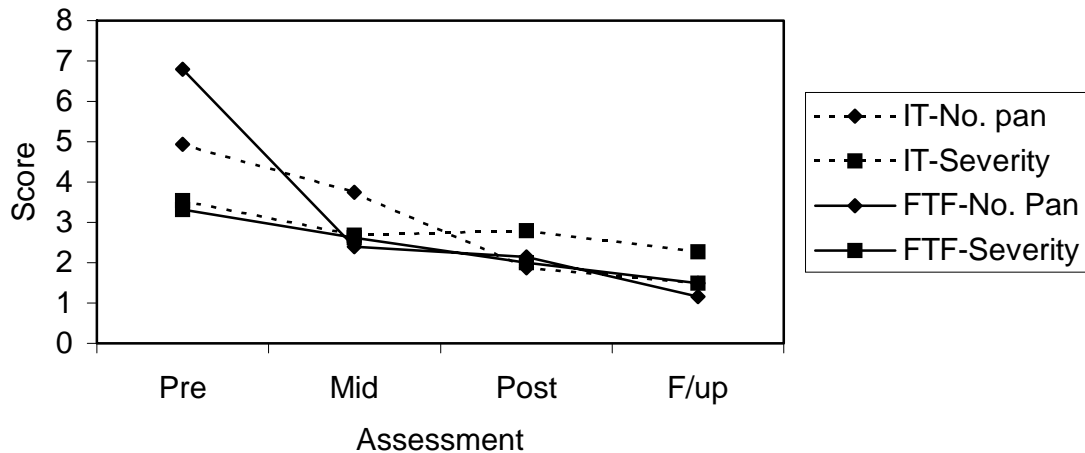




Figure 5. Changes in Face-to-face Therapy and Internet Therapy Reports in Number and Severity of Panic Attacks Over Treatment



3.1.4.2. Post-treatment and follow-up comparisons. A MANOVA was conducted to compare the change in post-treatment and follow-up scores between treatment groups. Results yielded an overall main effect approaching significance using a conservative alpha of .01,  $F(1, 19) = 3.79$ ,  $p = .019$ . There were no significant differences overall between treatment groups,  $F(1, 19) = 1.45$ ,  $p = .27$ . Specifically, there were no significant differences between treatment groups on any of the individual post-treatment/follow-up comparisons.

### 3.2. Intention-to-treat

Further analyses were conducted with intention-to-treat data. Intention-to-treat data were obtained by replicating the pre-treatment scores for the mid-,

post-, and follow-up treatment scores if no further data had been collected (i.e., to account for drop-outs). Intention-to-treat analyses assume that individuals who discontinued treatment did not improve as a result of the treatment that they received whilst in the program.

### 3.2.1. Face-to-face Therapy

3.2.1.1. Pre-treatment and post-treatment comparisons. A MANOVA between pre-treatment and post-treatment FTF scores yielded a main effect approaching significance using a conservative alpha of .01, suggesting that FTF therapy improved symptoms of panic disorder,  $F(1, 14) = 6.64, p = .011$ . Furthermore, as in the previous FTF analyses, only one individual measure did not significantly improve from pre-treatment to post-treatment, which was the number of panic attacks in the week prior to the respective assessments,  $F(1, 14) = 3.645, p = .077$  (see Table 8).

3.2.1.2. Post-treatment and follow-up comparisons. A MANOVA between post-treatment and follow-up scores in the FTF treatment group yielded a main effect approaching significance using a conservative alpha of .01, indicating that scores tended to continue to improve following treatment,  $F(1, 14) = 4.38, p = .033$ . Specifically, anxiety scores significantly improved between post-treatment and follow-up,  $F(1, 14) = 14.06, p = .002$ . In addition, improvement in scores on the BSQ and panic severity were approaching significance using a conservative alpha of .01,  $F(1, 14) = 7.28, p = .017$  and  $F(1, 14) = 8.33, p = .012$  respectively.

Table 8

Multivariate Analysis of Variance for Intention-to-treat Pre- and Post-Treatment Comparison for Face-to-face Therapy: Between Subjects Results

Source	<u>Df</u>	<u>F</u>	<u>P</u>	<u>Cohen's d</u>
Depression	1	50.57	.000**	1.40
Anxiety	1	37.12	.000**	1.55
ACQ	1	15.62	.001**	1.13
BSQ	1	26.64	.000**	1.42
MI accompanied	1	10.59	.006*	1.90
MI alone	1	20.58	.000**	1.17
Number of panic attacks (1 week prior)	1	3.65	.077	0.67
Panic severity	1	40.57	.000**	1.63

Note. \* $p < .01$  \*\* $p < .001$

### 3.2.2. Internet Therapy

3.2.2.1. Pre-treatment and post-treatment comparisons. A MANOVA between pre-treatment and post-treatment IT scores indicated that the main effect was not significant, showing that IT did not significantly improve symptoms of panic disorder overall,  $F(1, 14) = 1.00$ ,  $p = .507$ . However, similar to the previous IT analyses, two measures showed a significant improvement from pre- to post-treatment: BSQ,  $F(1, 14) = 9.11$ ,  $p = .009$ , and the severity of panic

attacks,  $F(1, 14) = 9.12$ ,  $p = .009$ . Again, the changes in anxiety scores on the DASS were approaching significance using a conservative alpha of .01,  $F(1, 14) = 6.02$ ,  $p = .028$  (see Table 9).

Table 9

Multivariate Analysis of Variance for Intention-to-treat Pre- and Post-Treatment Comparison for Internet Therapy: Between Subjects Results

Source	Df	F	P	d
Depression	1	1.72	.211	0.31
Anxiety	1	6.02	.028 <sup>#</sup>	0.38
ACQ	1	2.87	.113	0.41
BSQ	1	9.11	.009*	0.58
MI accompanied	1	.48	.501	0.05
MI alone	1	1.49	.242	0.25
Number of panic attacks (1 week prior)	1	3.42	.086	0.10
Panic severity	1	9.12	.009*	0.51

Note. \* $p < .01$  <sup>#</sup> $p < .05$

3.2.2.2. Post-treatment and follow-up comparisons. A MANOVA was conducted on the difference in scores between post-treatment and follow-up from the IT condition, from which the main effect was not significant,  $F(1, 14) = 1.00$ ,  $p = .493$ . Specifically, improvements on the anxiety subscale of the DASS and the

panic attack severity scores were approaching significance using a conservative alpha of .01,  $F(1, 14) = 5.20, p = .039$  and  $F(1, 14) = 5.63, p = .033$ , respectively.

### 3.2.3. Face-to-face Therapy Versus Internet Therapy

3.2.3.1. Pre-treatment and post-treatment comparisons. A MANOVA was conducted to compare the change in scores from pre-treatment to post-treatment results from the FTF condition to those from the IT condition after the data had been adapted to the intention-to-treat analyses. The analysis yielded an overall main effect, meaning that scores significantly improved following treatment,  $F(1, 28) = 7.10, p < .001$ . Between treatment group comparisons yielded a trend approaching significance using a conservative alpha of .01, suggesting that FTF therapy reduced scores on the measures more than IT,  $F(1, 28) = 2.80, p = .028$ . Notably, only one measure was not significant nor approaching significance, the number of panic attacks in the week prior to the assessment,  $F(1, 28) = 2.53, p = .123$ . Table 10 provides the results of the between-groups MANOVA analysis.

Post-treatment and follow-up comparisons. A MANOVA was conducted to compare the differences in scores at post-treatment and follow-up between treatment groups. Analyses yielded a main effect that was approaching significance using a conservative alpha of .01, indicating that across treatment groups, scores tended to improve following treatment,  $F(1, 28) = 3.44, p = .011$ . There were no significant differences in between group comparisons,  $F(1, 28) = 2.92, p = .094$ . Additionally, there were no significant differences on any

measures between treatment groups.

Table 10

Multivariate Analysis of Variance for Intention-to-treat Pre- and Post-Treatment Comparison of Face-to-face Therapy and Internet Therapy: Between Group Results

Source	<u>Df</u>	<u>F</u>	<u>P</u>
Depression	1	12.47	.001**
Anxiety	1	15.64	.000**
ACQ	1	6.21	.019 <sup>#</sup>
BSQ	1	6.27	.018 <sup>#</sup>
MI accompanied	1	8.97	.006*
MI alone	1	7.77	.009*
Number of panic attacks (1 week prior)	1	2.53	.123
Panic severity	1	13.44	.001**

Note. \* $p < .01$  \*\* $p < .001$  <sup>#</sup> $p < .05$

### 3.3. Working Alliance

Independent t-tests yielded no significant differences between IT and FTF conditions for overall scores on the WAI (both client and clinician forms).

Specifically, there were no significant differences across conditions for the WAI

(client),  $F(1, 20) = 1.622$ ,  $p = .120$ , or for the WAI (clinician),  $F(1, 20) = .984$ ,  $p = .336$ . Additionally, paired samples t-tests yielded no significant differences between scores on the WAI (client) and the WAI (clinician) in either the FTF condition,  $F(13) = 1.2$ ,  $p = .252$ , nor the IT condition,  $F(7) = .170$ ,  $p = .870$ . A comparison between the differences in scores on the WAI (client) and WAI (clinician) across FTF and IT conditions also yielded no significant differences,  $F(1, 20) = 2.569$ ,  $p = .848$ .

## 4. Discussion

### 4.1. Summary of Aims and Hypotheses

The current study aimed to test the efficacy of IT for panic disorder and compare IT to the equivalent FTF therapy. Secondary to this, the study also aimed to test whether working alliance can be established over the Internet to the same effect as FTF. Finally, results will indicate whether a well-established treatment manual designed to be administered FTF can be administered over the Internet with only minor adjustments. An increasing amount of research is being carried out on asynchronous IT, indicating that IT may be a plausible and efficacious form of administering CBT. Research into asynchronous IT is valuable as it can potentially reduce the amount of therapist-time an individual requires, and can make psychological treatment much more accessible and affordable. However, there has been very little empirical research into the efficacy of synchronous IT. Synchronous IT is valuable for reasons different from that of asynchronous IT. Synchronous IT offers similar benefits to that of FTF treatment, such as individually tailored and personal treatment. IT, however, is potentially available to those who may not have access to a mental health professional otherwise. Such research is therefore vital as synchronous IT, if effective, can be employed to treat an array of distinct populations, including the rural population, those with physical disabilities or hearing impairments, and others who are unable to attend FTF therapy for various reasons.

From the plethora of research conducted on FTF-administered CBT for



panic disorder, it was hypothesised that FTF treatment would significantly reduce symptomatology overall. Due to the relatively small amount of research conducted thus far on synchronous IT, no hypotheses were made *a priori* with respect to the results of IT. The study demonstrated four main points. First, the results confirmed that CBT delivered FTF is an effective treatment for panic disorder. Second, the results indicated IT is not as effective as FTF therapy for treating panic disorder. However, IT effectively reduces some specific components of panic disorder. Finally, there were no significant differences between groups in the level of working alliance, indicating that rapport can be established over the Internet as effectively as it can be developed FTF for those who remain in treatment.

## 4.2. Review of Results

4.2.1. Face-to-face therapy. As expected, results were commensurate with CBT literature and showed a significant decrease in overall symptomatology for those in the FTF treatment group. That is, CBT that is delivered FTF is an efficacious treatment method for panic disorder. Specifically, FTF treatment significantly reduced symptoms on every measure apart from one: the number of panic attacks in the week prior. Effect sizes were large (between .99 to 1.96) for these components of FTF therapy, yet the effect size of the number of panic attacks in the week prior was medium (.63). Several papers have discussed similar results, and suggest that trying to obtain a “panic-free” status is perhaps too ambitious, particularly in the short period of time that treatment occurred

within (Brown & Barlow, 1995). At the time of post-treatment and follow-up treatment assessments, participants were still completing several exposure hierarchies, including *in vivo* exposure, interoceptive exposure, and a combination of both of these. As a result of conducting these exposure hierarchies, it is understandable that panic attacks occurred in these situations. Importantly, although the number of panic attacks did not significantly decrease over the course of the treatment, the subjective ratings of panic attack severity decreased, which indicates that the impact of the remaining panic attacks was greatly reduced.

The intention-to-treat results for the FTF data yielded similar results. That is, overall FTF therapy significantly reduced panic symptomatology. Specifically, scores on all but one component significantly reduced over the course of treatment with large effect sizes (ranging from 1.13 to 1.90). Again, the only component that failed to reach significance was the number of panic attacks experienced in the week prior, although it indicated a medium effect size (.67).

With respect to follow-up treatment, results indicated that participants continued to improve following the final session of treatment over a four-week period. Such results suggest that over a longer period of time the number of panic attacks experienced would decrease as a result of the mastery of skills learnt throughout treatment combined with the cessation of exposure exercises.

4.2.2. Internet Therapy. Analyses indicated that overall IT of this length is not an effective form of treatment. However, two specific components of treatment significantly improved over the course of treatment: hypersensitivity to physical sensations (as measured by the BSQ) and panic attack severity. The effect sizes for these components were large (1.17 and 1.07 respectively). Notably, overall levels of anxiety appeared to decrease over the course of treatment, but did not meet the strict level of significance. The effect size, however, was medium to large (.75). In addition, the effect sizes of several other components of IT were medium, including depression (.59), agoraphobic cognitions (.53), and mobility when travelling alone (.55).

The intention-to-treat data were commensurate with the aforementioned results. That is, overall IT of this length was not shown to be an efficacious method of treatment for panic disorder. However, IT significantly reduced the same specific components of panic symptomatology mentioned above, including hypersensitivity to physical sensations and panic attack severity, with medium effect sizes of .58 and .51 respectively. Again, the overall levels of anxiety appeared to decrease with a small to medium effect size of .38, but did not reach significance. Notably, treatment showed small to medium effect sizes on decreasing levels of depression (.31) and agoraphobic cognitions (.41), and a small effect size for mobility when alone (.25).

Data collected at the 4-week follow-up yielded no significant differences,

indicating that participants did not experience an increase or a decrease in their panic symptomatology; further indicating that any treatment gains obtained over the course of therapy were maintained over the 4-week follow-up period.

4.2.3. Face-to-face therapy compared to Internet Therapy. Analyses indicated that there were no differences between FTF and IT in overall reduction of symptomatology as measured by the MANOVAs. That is, IT was neither better nor worse than FTF therapy in treating panic disorder as a whole. However, several components of panic appeared to decrease somewhat more in the FTF condition than that in the IT condition. For example, overall depression and anxiety, mobility when accompanied and panic severity showed non-significant trends in favour of FTF treatment. Interestingly, panic severity, and to a lesser extent overall anxiety, significantly decreased in the IT condition. Therefore, although IT decreases these components, they do not decrease to the extent that they would in FTF treatment. Some have argued that a decrease in overall anxiety is a placebo effect resulting from an individual receiving any form of treatment. Further research is required to establish whether such an argument is warranted in this case for IT or whether it is a genuine result of the specific form of treatment.

As there were a number of dropouts in the IT condition, an intention-to-treat analysis was performed. Such an analysis assumes that those individuals who dropped out of treatment did not improve, and hence their results on the

assessments remained unchanged. The intention-to-treat analyses that compared FTF to IT indicated that FTF treatment tended to improve overall symptoms of panic disorder somewhat better than IT of this length, however this effect was not significant to the strict levels imposed by the investigators. Specifically, levels of depression, anxiety and panic severity, as well as mobility both accompanied and alone all improved significantly more for individuals in the FTF condition. Also, agoraphobic cognitions and hypersensitivity to physical sensations tended to decrease to a greater extent in the FTF condition, however they were not statistically significant.

4.2.4. Working alliance. There were no differences between the IT and FTF conditions in quantitative levels of working alliance. Both client and clinician ratings of working alliance indicated that, for those who remained in treatment, a similar level of engagement and working alliance can be achieved over the Internet as can be obtained FTF. However, participants who completed the IT program also provided qualitative information about their IT experiences. For some participants the qualitative information conflicted with the overall quantitative results for attainment of working alliance online, which will be discussed in more detail below.

### 4.3. Qualitative Responses and Discussion of the Internet Therapy Process

All of the 8 participants who completed the IT program returned the

qualitative questionnaire about their IT experience. The responses gave a valuable insight into the participants' views, opinions and experiences of IT. The first question asked the participants to list the advantages that IT has over FTF therapy in their opinion. Six individuals discussed the convenience and the time-efficiency of IT. Additionally, three participants commented that receiving treatment in the comfort of their own homes allowed them a desired level of privacy and comfort, as well as it being less confrontational. That is to say, they did not need to leave the house (which is often their safety zone) to receive therapy.

In contrast, participants were also asked to list what they thought were the disadvantages of IT compared to FTF therapy. The most common responses were those regarding the speed of IT. That is, 7 individuals listed the speed of IT in some form as a disadvantage. Therefore the time it takes to write, send and receive a sentence means that less information is shared, and therefore there is less time for in depth discussions and questions. Another common response, one given by 4 participants, was that for various reasons, rapport was more difficult to develop compared to FTF therapy. Also, 2 participants stated that communication was difficult, which meant that there were miscommunications and at times confusion. Finally, the requirement for IT clients to be computer literate was also mentioned as a potential disadvantage of IT.

In response to problems and difficulties experienced during IT, 5

participants mentioned technical difficulties such as their computers crashing, or being unable at times to log onto the IT website. Other less common responses were being confused about the order of conversation in the chat-room and not feeling comfortable doing some components of therapy in a public place such as the library. The latter response was given by the only participant who completed the IT program in a public place. Such a response indicates that if IT was to be administered in rural areas, perhaps a private room with one computer in a general practitioner's practice may be more suitable than a more public area with more than one person present.

When asked about how comfortable they were with the IT approach, 4 participants responded that they were very comfortable, with one participant stating that "there were some embarrassing things that were much easier typed, instead of being face-to-face". Two participants said that they were reasonably comfortable with such an approach, and 2 participants said that were moderately comfortable.

Finally, the IT participants were asked whether they thought FTF therapy would have been more, less, or as effective as IT. Two participants responded that it would have been as effective, one participant said that it would have been less effective, and 5 participants thought that FTF therapy would have been more effective than IT.

The investigator also noted some of the intricacies of IT. For example, if a participant was silent for a lengthy period, it was difficult to know whether it was due to s/he experiencing technical difficulties, s/he not understanding the recent information, whether s/he was typing a long response at that moment, or a number of other explanations. In some instances, the investigator asked a further question or prompted a reply at the same time that the participant's response was sent, hence creating a confused and stunted dialogue.

Similar to the responses of the participants regarding communication, the investigator found it difficult to convey and interpret tone and expression during IT. In the absence of non-verbal interactions (e.g., smiling, eye contact, posture, etc.) and verbal cues (e.g., tone, volume, intonation and pitch of voice), it was often difficult to interpret the meaning of various statements and questions, which often led to misunderstandings, which in turn led to time-consuming questions and explanations.

The investigator also noticed that IT allowed more time to formulate a succinct phrase that expressed an idea in a clear manner. However, the investigator noted that she was less likely to spontaneously elaborate in sessions of IT compared to FTF sessions. That is, she may have stopped at one example during IT, but given several examples on the same topic during the respective FTF session. Hence, although the content was largely the same in both IT and FTF therapy, there was generally much more depth and detail in the FTF



sessions, which potentially led to greater understanding and less confusion of the content of therapy for those in the FTF condition.

#### 4.4. Clinical Implications

Overall, results indicate that while FTF therapy is generally more effective than IT for treating panic disorder for the general population with diagnosable panic disorder, there are some specific components of panic disorder that can potentially be treated effectively over the Internet. Also, there may be some specific individual differences that make an individual more or less likely to benefit from IT.

Specifically, the results from the general statistical analyses indicate that IT can significantly reduce the hypersensitivity to physical sensations that is typical of individuals with panic disorder. Interoceptive exposure is the technique that is employed to reduce this hypersensitivity, and hence the results demonstrate that this component of treatment can be administered successfully over the Internet. Such a finding is extremely clinically relevant, as it indicates that if IT is used as an adjunctive treatment to FTF therapy, then it would be advised to include the interoceptive exposure component of treatment as part of the IT program.

Having conducted the two different analyses: the general statistical analysis and the intention-to-treat analysis; different clinical conclusions may be

drawn. Clinically, both types of analyses are important and it is useful to consider both the general and intention-to-treat analyses. The general analysis indicates how effective IT would be for those who adhere to the treatment and accept it as a form of psychological treatment. The general analysis indicates that for those who adhere to treatment and do not dropout, treatment can be equally beneficial to that of FTF treatment. Such results are promising for IT, however more information is required to determine what kind of individual adheres to IT and accepts it, and would therefore benefit from it.

Intention-to-treat analyses, however, usually indicate what the treatment would be like for the general population, and assume that those who drop out of treatment do not improve any further after terminating the treatment program. Therefore, intention-to-treat analyses indicate what IT would be like for all clients who commence IT, rather than only those who completed the treatment. For example, these results indicate how IT may perform for all individuals in the rural population who have panic disorder, rather than only those who choose to commence and adhere to the IT treatment program. Again, such information is extremely clinically relevant, as the results indicate that IT is potentially less effective than FTF treatment overall, but IT can be used to treat specific components of panic disorder effectively.

In a clinical setting, it would be far less than optimal to have an attrition rate similar to that of the IT condition (i.e., 47%). Therefore, if the details of what

make a client adhere to and benefit from IT can be defined, then the administration of IT can potentially be as effective as the respective FTF treatment. The attrition rate of IT compared to that of FTF therapy indicates that IT is not the preferred treatment option for all clients. Therefore, one must consider what may be lacking in IT for some individuals to dropout and others to continue and also benefit from IT. Key components of treatment such as engagement and motivation may be less than optimal in IT. Although there were no quantitative differences between levels of working alliance between IT and FTF treatments, some qualitative information from those in the IT indicated that engagement may have been more difficult online. Furthermore, the qualitative information was received only from those who completed the IT program, which elicits questions about, and perhaps doubt over, the engagement difficulties of those who terminated their participation in IT. Additionally, several participants in the IT condition who dropped out of treatment reported that they instead accessed alternate FTF treatment. Such an option would not exist for rural recipients of IT, as FTF treatment is a limited resource. The same argument exists for those with severe agoraphobia. Therefore, adherence to IT may be higher for those patients with fewer alternatives for treatment. Research into this possibility would be difficult, as one cannot randomly assign city/country residence; however such research, limitations included, would be valuable.

Compared to those participants who remained in the treatment program, participants who dropped out had significantly higher levels of depression at pre-

treatment (see Appendix F for analysis), thus indicating that a higher level of comorbid depression decreases the likelihood of a client remaining in therapy, and in IT in particular. There were no other significant differences between participants who dropped out and those who completed the program.

The high attrition rate for IT may also have other clinical implications. Perhaps clients who receive treatment over the Internet do not gain as much motivation as those who receive treatment FTF. Having FTF contact between therapist and client (e.g., having the therapist in the same room and having an image of him/her between each therapy session) may act as a further motivator throughout therapy. For example, having to look the therapist in the eye and tell him/her why the homework has not been completed is potentially an unpleasant task, and may be an additional motivator to conduct the anxiety-provoking *in vivo* exercises. In IT, however, the eye contact and other nonverbal responses are not present, and admitting to not completing the homework tasks may be somewhat easier. Although more research into levels of motivation in IT is required, it is important to be mindful of a potential lack of motivation in IT clients compared to the respective FTF clients, and therefore include motivational exercises in the therapeutic approach to IT. Also, several of the participants who dropped out of IT reported that they intended to receive alternate treatment FTF. Such information indicates that their motivation for treatment remained, however their motivation to receive treatment over the Internet did not, hence indicating that IT is currently not a treatment of choice for everyone, as will be discussed

shortly.

Overall, the current study has shown that administering synchronous treatment over the Internet is possible using a relatively unchanged standard manual designed primarily for FTF treatment. However, as a result of both the investigator's experiences of administering CBT online and the IT participants' feedback, it is thought that redesigning some components of the treatment manual to make it more suited for conducting the optimal online treatment would be beneficial to the overall efficacy of IT.

#### 4.5. Limitations

Due to the novel and complex nature of IT research, there were a number of complications and limitations experienced throughout the study. To start, there was no formal therapist training with respect to administering IT. Therefore it is possible that with more formal training as well as additional practice and experience, the IT may have been more effective. At the commencement of the data collection, the investigator had one year of formal clinical training administering CBT on an individual, FTF basis. Comparatively, she had no training in IT beyond reading various reviews and descriptions of IT sessions, discussing the procedure with a clinical psychologist with IT experience, as well as becoming accustomed with the IT website. Such a discrepancy in training and experience may have led to a difference in efficacy between the two styles of therapy.

Another limitation to the current study was the small number of participants. Although significant results were found in several areas, small to medium effect sizes may not have been detected as clinically significant due to the lack of power. An increase in number of participants may have statistically increased the efficacy of IT, or conversely, made the difference between the efficacy of IT and FTF therapy greater. Due to limited time and resources of the research project, only 30 participants were tested, however future studies would benefit from using more participants.

An additional limiting factor was the number of dropouts. Although attrition is always expected in any treatment-outcome study, there were a substantial number of dropouts in the current study, as previously discussed. Interestingly, the number of dropouts between the groups was uneven, which in itself gives an indication of the potential difficulties of IT. Three-and-a-half times more participants dropped out of IT compared with the FTF treatment, as previously discussed. The clinical implications of such a dropout rate will be discussed at greater length shortly. However, a high dropout rate in addition to low numbers at the commencement of the treatment program limit the number of assumptions that can be drawn, and allow for the individual differences of participants to become a more considerable potential extraneous variable.

Although the research was manualised and the investigator adhered to the

manual to the best of her ability, a validation of the treatment program would have indicated how accurately this was done. Resources did not allow such a validation, and therefore one cannot safely assume that the treatment manual was strictly and perfectly adhered to.

As previously mentioned, synchronous IT is more time consuming as it takes longer to type information than it does to speak it. Therefore, it is possible that synchronous IT may be effective over a longer period of time (i.e., with more sessions). Research may possibly address this in the future, however the main aim of this research was to determine whether IT was as effective as FTF. When the treatment program was administered FTF, it significantly decreased panic symptomatology, indicating that the treatment was long enough. Therefore, the results suggest that over the same amount of time, FTF therapy effectively reduces panic symptomatology whereas IT does not (see section 4.6 for more information).

The intention-to treat-analyses also need to be addressed, due to the nature of several of the dropouts. That is, several participants ceased participation in the IT condition to seek FTF treatment and therefore their “intention to treat” remained. Information regarding if and when they sought and received treatment, and how much they benefited from that treatment would have been valuable.

Due to the issues of attrition and power, perhaps analyses were too conservative and may not suggest that there were no significant differences between groups, but rather that more power is required in order to detect these differences. Several different types of statistical analyses could have been carried out. MANOVAs were used in the current study, however repeated measures may have been viable given the attrition rate and limited amount of power. MANOVAs would have been the most appropriate analysis if the power was improved.

The aforementioned limitations are specific to the current study, however there are a number of general limitations that are worthy of discussion. The following limitations were experienced throughout the current study, but are considered to be limitations of conducting synchronous IT at this current point in time.

The speed of the computers used by the participants in the IT condition varied somewhat. Some participants had dial-up connections that were slow and sometimes unreliable, whereas others had very fast and efficient cable connections. Additionally, the speed of the Making Changes website was slower than an average chat-based website. The slower speed was due to the high-level encryption process that was used to ensure client confidentiality during and between IT sessions. Providing the highest level of online security and therefore confidentiality was obviously a prime concern, and therefore the speed of the



conversations had to be compromised. However, in the qualitative feedback, a number of participants in the IT condition reported that they found the IT process quite slow, which potentially affected the levels of engagement and rapport between participant and investigator, despite there being no significant quantitative differences between treatment groups in working alliance. Over time, the speed of IT is expected to increase as both encryption and connection technologies improve.

The speed of IT translated to less subject matter being covered in the IT condition compared with the FTF condition. Time constraints may have acted in both positive and negative ways. The IT literature has suggested that it takes longer to communicate something online than it does FTF. Therefore, the manual was adapted with such time constraints in mind, so that there would be enough time in an IT session to cover material for each session. However, this meant that there was often extra time in the FTF sessions, as the same material is covered much quicker. The positive aspect of time constraints in IT was that during IT, both participant and investigator were aware of the limited time in each session, and therefore remained task-focussed throughout each session. At times during the FTF sessions, however, the topics were more likely to become tangential, as there was less time pressure.

In contrast, and as previously mentioned, there are negative aspects of the time constraints in IT compared with FTF treatment. Throughout FTF

treatment, more in-depth discussions of relevant treatment topics were afforded due to the pace at which a FTF conversation occurs. However, in the IT condition, such conversations and clarifications were less common, as they may have meant that another piece of important information was not discussed.

#### 4.6. Future Directions

The current study is one of very few empirical research investigations comparing synchronous IT to its FTF counterpart. The results have implied several important points, which need to be addressed by way of further research. Such implications are that IT can be useful in treating specific components of panic disorder, and that IT has a much higher dropout rate than the respective FTF treatment. Therefore, additional research is still required to confirm these results and to further develop our knowledge and understanding of the uses and limitations of IT.

As previously discussed, the current study recruited 30 participants. Future research using a greater number of participants would increase the statistical power and potentially confirm the current findings. Often, research trials that are undertaken using a small number of participants are more vulnerable to outliers, individual differences and other such extraneous variables. However, once the number of participants increases, the likelihood of these factors affecting the overall results becomes much smaller.

The number of dropouts in the IT condition was noticeably more than that in the FTF condition. Although follow-up information was not meticulously gathered on those participants who dropped out of the study, such information could have been quite valuable. Collecting information of this nature would afford some insight into the thoughts, beliefs, attitudes, and illness severity that make individuals continue with IT. Knowing whether participants ceased treatment because they became symptom-free, or because they felt that they were not benefiting from the treatment and sought alternate help, or for other reasons would be valuable in determining what individuals are best suited for IT. The participants' preference for either IT or FTF treatment may also be useful, to see whether their preferences correlate with the dropouts. Furthermore, the information would indicate what kinds of clients are suitable for, and would benefit from, IT. Research into who would benefit or not benefit from treatment over the Internet could lead to a time- and cost-efficient process of selecting appropriate clients for, and allocating the resources of, IT.

Future research may also investigate the length of treatment required. As mentioned previously, information takes longer to communicate over the Internet than it does to say the same information FTF. Therefore, 6 sessions of FTF treatment may be equivalent to 12-18 sessions of IT. Although offering a different number of sessions for different conditions has the potential to introduce a number of added extraneous variables, it is necessary to see if more sessions of IT makes it more efficacious.

Other information to be considered in future research is the effect of agoraphobia on progress in, and efficacy of, IT. Correlations between the extent of agoraphobia and progress would provide valuable information into whether IT reinforces a client's difficulties in leaving his/her safety zone, or in contrast if it allows treatment to take place in an environment where the client is comfortable and able to concentrate and comprehend at a higher level. Also, comorbidities need to be considered, which would indicate if and to what extent they complicate and potentially retard progress in IT compared to FTF therapy.

The current study tested IT as a sole treatment for panic disorder and indicated that IT is not effective in reducing overall panic symptomatology. The results have suggested that IT is effective in treating some components of panic disorder, yet ineffective or not as effective as FTF therapy for treating other components. Therefore, IT may be used as an adjunctive treatment to FTF therapy. That is, the components of IT that proved to be effective can be performed over the Internet and those components that are treated more effectively FTF can be done in that way. Specifically, interoceptive exposure can be effectively performed over the Internet as well as the components that reduce overall anxiety and panic severity, such as psychoeducation, breathing retraining, and relapse prevention. The remaining components could be treated FTF. Therefore, future research of great benefit would test whether this is the ideal balance between IT and FTF treatment, and ultimately determine what the

optimal balance between these two forms of treatment is.

Furthermore, research that involves current Internet technology such as webcams and services that allow webcam images to be sent over the Internet (such as Skype) will provide important information as to whether FTF-style therapy can be administered over the Internet with the client and therapist potentially in different cities.

Finally, research on IT has focussed mostly on treating panic disorder, for reasons explained earlier. However, other disorders, particularly other anxiety disorders such as specific phobia and social phobia, may benefit from IT. Research that examines the efficacy of IT on other disorders can potentially generalise the use for IT further than panic disorder only.

#### 4.7. Conclusions

In summary, the implications for IT are mixed. There were no significant differences between IT and FTF in the overall efficacy of the treatment of panic disorder. However, the rate of attrition for IT relative to FTF was high, indicating that for various reasons IT is not the optimal treatment method for all clients. However, IT proved to be effective in decreasing several specific symptoms of panic disorder, such as hypersensitivity to physical sensations, panic attack severity and, to a slightly lesser extent, overall anxiety. Results imply that working alliance can be achieved equally well online as it can be FTF, however

quantitative responses indicated that this might not always be the case for everyone receiving IT. The results of the current study indicate that IT may be extremely valuable as an adjunctive treatment method to that of FTF therapy, particularly to individuals who cannot easily access FTF therapy on a regular basis. However, before IT is used as an adjunctive method of treatment for panic disorder, and particularly as a sole treatment for panic disorder, further research is required into IT and its specific uses.

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Appendix A

Recruitment Letter Sent to Local and Referring General Practitioners



Psychology Clinic  
School of Psychology  
University of Sydney

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Miss Lyndel Mayoh  
Transient Building F12  
University of Sydney  
2006

Re: Treatment Available for Panic Disorder

Dear Dr. \_\_\_\_\_,

I am writing in regards to a study I am conducting for my Doctor of Clinical Psychology degree at the University of Sydney with Professor Stephen Touyz, Doctor Caroline Hunt and Doctor Timothy Sharp.

Cognitive behaviour therapy is an effective treatment for panic disorder, and we are interested in assessing whether this treatment can be effective when delivered over the Internet. If we find this to be the case, there may be considerable advantages for some patients to receive treatment over the Internet in their own homes. Individuals who agree to participate in the study will be randomly allocated to either a face-to-face treatment group, or an Internet therapy treatment group. Each suitable participant will receive seven sessions of cognitive behaviour therapy over ten weeks, **free of charge**. Eligible participants will be those who experience regular panic attacks that cause distress or cause the patient to change their behaviour because of these attacks.

Participants will be screened for computer literacy and Internet access, fluency in English, and they must be over 18 years of age. We are currently accepting referrals to the University of Sydney Psychology Clinic. Please contact me on 9351-4066 should you wish to refer a patient or have any further questions about the study.

I sincerely appreciate your assistance

Lyndel Mayoh  
Intern Clinical Psychologist

## Appendix B

Treatment Manual: Cognitive-Behavioural Therapy for Panic Disorder

Appendix C

Assessment Measures

Appendix D

Participant Information Sheet and Consent Form



Appendix E

Approval by University of Sydney Human Research Ethics Committee

Appendix F

Statistical Analyses

Pre-treatment t-tests

**Group Statistics**

	face-to-face vs. Internet therapy condition	N	Mean	Std. Deviation	Std. Error Mean
Age at assessment	face-to-face	15	33.80	14.239	3.676
	Internet therapy	15	31.00	11.964	3.089
sex	face-to-face	15	.6667	.48795	.12599
	Internet therapy	15	.8000	.41404	.10690
depression score on DASS	face-to-face	15	19.0000	8.49370	2.19306
	Internet therapy	15	17.2667	12.16239	3.14032
anxiety score on DASS	face-to-face	15	24.2000	9.00952	2.32625
	Internet therapy	15	22.3333	7.78888	2.01108
score on ACQ	face-to-face	15	2.3213	.81405	.21019
	Internet therapy	15	2.4693	.67171	.17343
score on BSQ	face-to-face	15	2.5893	.80341	.20744
	Internet therapy	15	2.9567	.78636	.20304
score on mobility inventory accompanied	face-to-face	15	2.0167	.99171	.25606
	Internet therapy	15	2.0627	.90608	.23395
score on mobility inventory alone	face-to-face	15	2.4067	1.01801	.26285
	Internet therapy	15	2.6207	1.12025	.28925
how many panic attacks in past week	face-to-face	15	6.8000	8.57071	2.21295
	Internet therapy	15	4.9333	5.41778	1.39887
severity of panic attack on mobility inventory	face-to-face	15	3.3200	.85373	.22043
	Internet therapy	15	3.5400	.60804	.15700

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Age at assessment	Equal variances assumed	.581	.452	.583	28	.564	2.800	4.802	-7.036	12.636
	Equal variances not assumed			.583	27.193	.565	2.800	4.802	-7.050	12.650
sex	Equal variances assumed	2.635	.116	-.807	28	.426	-.13333	.16523	-.47180	.20513
	Equal variances not assumed			-.807	27.277	.427	-.13333	.16523	-.47220	.20553
depression score on DASS	Equal variances assumed	3.350	.078	.453	28	.654	1.73333	3.83029	-6.11266	9.5793
	Equal variances not assumed			.453	25.032	.655	1.73333	3.83029	-6.15479	9.6215
anxiety score on DASS	Equal variances assumed	.323	.574	.607	28	.549	1.86667	3.07504	-4.43227	8.1656
	Equal variances not assumed			.607	27.427	.549	1.86667	3.07504	-4.43820	8.1715
score on ACQ	Equal variances assumed	1.570	.221	-.543	28	.591	-.14800	.27250	-.70620	.41020
	Equal variances not assumed			-.543	27.026	.592	-.14800	.27250	-.70711	.41111
score on BSQ	Equal variances assumed	.186	.670	-1.265	28	.216	-.36733	.29027	-.96192	.22725
	Equal variances not assumed			-1.265	27.987	.216	-.36733	.29027	-.96193	.22727
score on mobility inventory accompanied	Equal variances assumed	.092	.764	-.133	28	.895	-.04600	.34684	-.75647	.66447
	Equal variances not assumed			-.133	27.775	.895	-.04600	.34684	-.75673	.66473
score on mobility inventory alone	Equal variances assumed	.231	.635	-.548	28	.588	-.21400	.39084	-1.01459	.58659
	Equal variances not assumed			-.548	27.747	.588	-.21400	.39084	-1.01492	.58692
how many panic attacks in past week	Equal variances assumed	.401	.531	.713	28	.482	1.86667	2.61801	-3.49608	7.2294
	Equal variances not assumed			.713	23.648	.483	1.86667	2.61801	-3.54090	7.2742
severity of panic attack on mobility inventory	Equal variances assumed	2.196	.150	-.813	28	.423	-.22000	.27063	-.77435	.33435
	Equal variances not assumed			-.813	25.296	.424	-.22000	.27063	-.77703	.33703

## Face-to-face Analyses: Pre-post Results (MANOVA)

### General Linear Model-FTF

#### Multivariate Tests <sup>b</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.947	13.315 <sup>a</sup>	8.000	6.000	.003
	Wilks' Lambda	.053	13.315 <sup>a</sup>	8.000	6.000	.003
	Hotelling's Trace	17.753	13.315 <sup>a</sup>	8.000	6.000	.003
	Roy's Largest Root	17.753	13.315 <sup>a</sup>	8.000	6.000	.003

a. Exact statistic

b. Design: Intercept

#### Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxprepost	.000 <sup>a</sup>	0	.	.	.
	depprepost	.000 <sup>a</sup>	0	.	.	.
	BSQprepost	.000 <sup>a</sup>	0	.	.	.
	ACQprepost	.000 <sup>a</sup>	0	.	.	.
	Mlaccprepost	.000 <sup>a</sup>	0	.	.	.
	Mlalprepost	.000 <sup>a</sup>	0	.	.	.
	nopanwkprepost	.000 <sup>a</sup>	0	.	.	.
	sevprepost	.000 <sup>a</sup>	0	.	.	.
Intercept	anxprepost	3680.643	1	3680.643	45.554	.000
	depprepost	1874.571	1	1874.571	67.800	.000
	BSQprepost	16.007	1	16.007	30.667	.000
	ACQprepost	10.789	1	10.789	16.883	.001
	Mlaccprepost	8.239	1	8.239	11.138	.005
	Mlalprepost	11.089	1	11.089	22.878	.000
	nopanwkprepost	292.571	1	292.571	3.695	.077
	sevprepost	23.921	1	23.921	50.901	.000
Error	anxprepost	1050.357	13	80.797		
	depprepost	359.429	13	27.648		
	BSQprepost	6.785	13	.522		
	ACQprepost	8.307	13	.639		
	Mlaccprepost	9.616	13	.740		
	Mlalprepost	6.301	13	.485		
	nopanwkprepost	1029.429	13	79.187		
	sevprepost	6.109	13	.470		
Total	anxprepost	4731.000	14			
	depprepost	2234.000	14			
	BSQprepost	22.793	14			
	ACQprepost	19.096	14			
	Mlaccprepost	17.856	14			
	Mlalprepost	17.391	14			
	nopanwkprepost	1322.000	14			
	sevprepost	30.030	14			
Corrected Total	anxprepost	1050.357	13			
	depprepost	359.429	13			
	BSQprepost	6.785	13			
	ACQprepost	8.307	13			
	Mlaccprepost	9.616	13			
	Mlalprepost	6.301	13			
	nopanwkprepost	1029.429	13			
	sevprepost	6.109	13			

a. R Squared = .000 (Adjusted R Squared = .000)

Face-to-face Analyses: Post-follow-up Results (MANOVA)

**General Linear Model FTF (post-follow-up)**

**Between-Subjects Factors**

	Value Label	N
face-to-face vs. Internet therapy condition	face-to-face	13

**Multivariate Tests<sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.962	15.705 <sup>a</sup>	8.000	5.000	.004
	Wilks' Lambda	.038	15.705 <sup>a</sup>	8.000	5.000	.004
	Hotelling's Trace	25.127	15.705 <sup>a</sup>	8.000	5.000	.004
	Roy's Largest Root	25.127	15.705 <sup>a</sup>	8.000	5.000	.004
tmtgrp	Pillai's Trace	.000	. <sup>a</sup>	.000	.000	.
	Wilks' Lambda	1.000	. <sup>a</sup>	.000	8.500	.
	Hotelling's Trace	.000	. <sup>a</sup>	.000	2.000	.
	Roy's Largest Root	.000	.000 <sup>a</sup>	8.000	4.000	1.000

a. Exact statistic

b. Design: Intercept+tmtgrp

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxpostfup	.000 <sup>a</sup>	0	.	.	.
	deppostfup	.000 <sup>a</sup>	0	.	.	.
	acqpostfup	.000 <sup>a</sup>	0	.	.	.
	bsqpostfup	.000 <sup>a</sup>	0	.	.	.
	miaccpostfu	.000 <sup>a</sup>	0	.	.	.
	mialpostfu	.000 <sup>a</sup>	0	.	.	.
	miwkpostfup	.000 <sup>a</sup>	0	.	.	.
	sevpostfup	.000 <sup>a</sup>	0	.	.	.
Intercept	anxpostfup	56.077	1	56.077	16.444	.002
	deppostfup	24.923	1	24.923	3.782	.076
	acqpostfup	.072	1	.072	.336	.573
	bsqpostfup	.910	1	.910	7.821	.016
	miaccpostfu	.057	1	.057	1.691	.218
	mialpostfu	.393	1	.393	2.294	.156
	miwkpostfup	13.000	1	13.000	1.345	.269
	sevpostfup	3.250	1	3.250	9.070	.011
tmtgrp	anxpostfup	.000	0	.	.	.
	deppostfup	.000	0	.	.	.
	acqpostfup	.000	0	.	.	.
	bsqpostfup	.000	0	.	.	.
	miaccpostfu	.000	0	.	.	.
	mialpostfu	.000	0	.	.	.
	miwkpostfup	.000	0	.	.	.
	sevpostfup	.000	0	.	.	.
Error	anxpostfup	40.923	12	3.410		
	deppostfup	79.077	12	6.590		
	acqpostfup	2.582	12	.215		
	bsqpostfup	1.397	12	.116		
	miaccpostfu	.404	12	.034		
	mialpostfu	2.055	12	.171		
	miwkpostfup	116.000	12	9.667		
	sevpostfup	4.300	12	.358		
Total	anxpostfup	97.000	13			
	deppostfup	104.000	13			
	acqpostfup	2.654	13			
	bsqpostfup	2.307	13			
	miaccpostfu	.461	13			
	mialpostfu	2.448	13			
	miwkpostfup	129.000	13			
	sevpostfup	7.550	13			
Corrected Total	anxpostfup	40.923	12			
	deppostfup	79.077	12			
	acqpostfup	2.582	12			
	bsqpostfup	1.397	12			
	miaccpostfu	.404	12			
	mialpostfu	2.055	12			
	miwkpostfup	116.000	12			
	sevpostfup	4.300	12			

a. R Squared = .000 (Adjusted R Squared = .000)

## Internet Therapy Analyses: Pre-Post Results (MANOVA)

### General Linear Model IT (post-follow-up)

#### Multivariate Tests <sup>b</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.962	3.643 <sup>a</sup>	7.000	1.000	.384
	Wilks' Lambda	.038	3.643 <sup>a</sup>	7.000	1.000	.384
	Hotelling's Trace	25.498	3.643 <sup>a</sup>	7.000	1.000	.384
	Roy's Largest Root	25.498	3.643 <sup>a</sup>	7.000	1.000	.384

a. Exact statistic

b. Design: Intercept

#### Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxprepost	.000 <sup>a</sup>	0	.	.	.
	depprepost	.000 <sup>a</sup>	0	.	.	.
	ACQprepost	.000 <sup>a</sup>	0	.	.	.
	BSQprepost	.000 <sup>a</sup>	0	.	.	.
	Mlaccprepost	.000 <sup>a</sup>	0	.	.	.
	Mlalprepost	.000 <sup>a</sup>	0	.	.	.
	nopanwkprepost	.000 <sup>a</sup>	0	.	.	.
	sevprepost	.000 <sup>a</sup>	0	.	.	.
Intercept	anxprepost	378.125	1	378.125	9.038	.020
	depprepost	162.000	1	162.000	1.806	.221
	ACQprepost	1.288	1	1.288	3.273	.113
	BSQprepost	4.667	1	4.667	19.826	.003
	Mlaccprepost	.039	1	.039	.461	.519
	Mlalprepost	.891	1	.891	1.540	.255
	nopanwkprepost	12.500	1	12.500	4.070	.083
	sevprepost	4.061	1	4.061	19.898	.003
Error	anxprepost	292.875	7	41.839		
	depprepost	628.000	7	89.714		
	ACQprepost	2.755	7	.394		
	BSQprepost	1.648	7	.235		
	Mlaccprepost	.595	7	.085		
	Mlalprepost	4.050	7	.579		
	nopanwkprepost	21.500	7	3.071		
	sevprepost	1.429	7	.204		
Total	anxprepost	671.000	8			
	depprepost	790.000	8			
	ACQprepost	4.043	8			
	BSQprepost	6.314	8			
	Mlaccprepost	.634	8			
	Mlalprepost	4.941	8			
	nopanwkprepost	34.000	8			
	sevprepost	5.490	8			
Corrected Total	anxprepost	292.875	7			
	depprepost	628.000	7			
	ACQprepost	2.755	7			
	BSQprepost	1.648	7			
	Mlaccprepost	.595	7			
	Mlalprepost	4.050	7			
	nopanwkprepost	21.500	7			
	sevprepost	1.429	7			

a. R Squared = .000 (Adjusted R Squared = .000)



## Internet Therapy Analyses: Post-Follow-up Results (MANOVA)

### General Linear Model - IT (post-follow-up)

#### Multivariate Tests <sup>b</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.875	1.000 <sup>a</sup>	7.000	1.000	.649
	Wilks' Lambda	.125	1.000 <sup>a</sup>	7.000	1.000	.649
	Hotelling's Trace	7.000	1.000 <sup>a</sup>	7.000	1.000	.649
	Roy's Largest Root	7.000	1.000 <sup>a</sup>	7.000	1.000	.649

a. Exact statistic

b. Design: Intercept

#### Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxpostfup	.000 <sup>a</sup>	0	.	.	.
	deppostfup	.000 <sup>a</sup>	0	.	.	.
	acqpostfup	.000 <sup>a</sup>	0	.	.	.
	bsqpostfup	.000 <sup>a</sup>	0	.	.	.
	miaccpostfu	.000 <sup>a</sup>	0	.	.	.
	mialpostfu	.000 <sup>a</sup>	0	.	.	.
	miwkpostfup	.000 <sup>a</sup>	0	.	.	.
	sevpostfup	.000 <sup>a</sup>	0	.	.	.
Intercept	anxpostfup	105.125	1	105.125	7.223	.031
	deppostfup	.125	1	.125	.020	.890
	acqpostfup	.118	1	.118	3.704	.096
	bsqpostfup	.044	1	.044	.405	.545
	miaccpostfu	.095	1	.095	.915	.371
	mialpostfu	.074	1	.074	.610	.460
	miwkpostfup	1.125	1	1.125	2.032	.197
	sevpostfup	2.205	1	2.205	8.145	.025
Error	anxpostfup	101.875	7	14.554		
	deppostfup	42.875	7	6.125		
	acqpostfup	.222	7	.032		
	bsqpostfup	.751	7	.107		
	miaccpostfu	.724	7	.103		
	mialpostfu	.850	7	.121		
	miwkpostfup	3.875	7	.554		
	sevpostfup	1.895	7	.271		
Total	anxpostfup	207.000	8			
	deppostfup	43.000	8			
	acqpostfup	.340	8			
	bsqpostfup	.795	8			
	miaccpostfu	.818	8			
	mialpostfu	.925	8			
	miwkpostfup	5.000	8			
	sevpostfup	4.100	8			
Corrected Total	anxpostfup	101.875	7			
	deppostfup	42.875	7			
	acqpostfup	.222	7			
	bsqpostfup	.751	7			
	miaccpostfu	.724	7			
	mialpostfu	.850	7			
	miwkpostfup	3.875	7			
	sevpostfup	1.895	7			

a. R Squared = .000 (Adjusted R Squared = .000)

Face-to-face vs. Internet Therapy Analyses: Pre-Post Results (MANOVA)

**General Linear Model FTF vs. IT (pre-post)**

**Between-Subjects Factors**

		Value Label	N
face-to-face vs. Internet therapy condition	.00	face-to-face	14
	1.00	Internet therapy	8

**Multivariate Tests<sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.846	8.955 <sup>a</sup>	8.000	13.000	.000
	Wilks' Lambda	.154	8.955 <sup>a</sup>	8.000	13.000	.000
	Hotelling's Trace	5.511	8.955 <sup>a</sup>	8.000	13.000	.000
	Roy's Largest Root	5.511	8.955 <sup>a</sup>	8.000	13.000	.000
tmtgrp	Pillai's Trace	.459	1.380 <sup>a</sup>	8.000	13.000	.291
	Wilks' Lambda	.541	1.380 <sup>a</sup>	8.000	13.000	.291
	Hotelling's Trace	.849	1.380 <sup>a</sup>	8.000	13.000	.291
	Roy's Largest Root	.849	1.380 <sup>a</sup>	8.000	13.000	.291

a. Exact statistic

b. Design: Intercept+tmtgrp

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxprepost	444.041 <sup>a</sup>	1	444.041	6.612	.018
	depprepost	254.571 <sup>b</sup>	1	254.571	5.156	.034
	ACQprepost	1.156 <sup>c</sup>	1	1.156	2.091	.164
	BSQprepost	.475 <sup>d</sup>	1	.475	1.127	.301
	Mlaccprepost	2.474 <sup>e</sup>	1	2.474	4.846	.040
	Mlalprepost	1.575 <sup>f</sup>	1	1.575	3.043	.096
	nopanwkprepost	56.162 <sup>g</sup>	1	56.162	1.069	.314
	sevprepost	1.800 <sup>h</sup>	1	1.800	4.776	.041
Intercept	anxprepost	2714.041	1	2714.041	40.411	.000
	depprepost	1314.935	1	1314.935	26.634	.000
	ACQprepost	8.329	1	8.329	15.059	.001
	BSQprepost	17.106	1	17.106	40.568	.000
	Mlaccprepost	3.568	1	3.568	6.988	.016
	Mlalprepost	7.624	1	7.624	14.730	.001
	nopanwkprepost	172.526	1	172.526	3.283	.085
	sevprepost	20.766	1	20.766	55.096	.000
tmtgrp	anxprepost	444.041	1	444.041	6.612	.018
	depprepost	254.571	1	254.571	5.156	.034
	ACQprepost	1.156	1	1.156	2.091	.164
	BSQprepost	.475	1	.475	1.127	.301
	Mlaccprepost	2.474	1	2.474	4.846	.040
	Mlalprepost	1.575	1	1.575	3.043	.096
	nopanwkprepost	56.162	1	56.162	1.069	.314
	sevprepost	1.800	1	1.800	4.776	.041
Error	anxprepost	1343.232	20	67.162		
	depprepost	987.429	20	49.371		
	ACQprepost	11.062	20	.553		
	BSQprepost	8.433	20	.422		
	Mlaccprepost	10.211	20	.511		
	Mlalprepost	10.352	20	.518		
	nopanwkprepost	1050.929	20	52.546		
	sevprepost	7.538	20	.377		
Total	anxprepost	5402.000	22			
	depprepost	3024.000	22			
	ACQprepost	23.139	22			
	BSQprepost	29.107	22			
	Mlaccprepost	18.490	22			
	Mlalprepost	22.332	22			
	nopanwkprepost	1356.000	22			
	sevprepost	35.520	22			
Corrected Total	anxprepost	1787.273	21			
	depprepost	1242.000	21			
	ACQprepost	12.219	21			
	BSQprepost	8.908	21			
	Mlaccprepost	12.686	21			
	Mlalprepost	11.927	21			
	nopanwkprepost	1107.091	21			
	sevprepost	9.338	21			

- a. R Squared = .248 (Adjusted R Squared = .211)
- b. R Squared = .205 (Adjusted R Squared = .165)
- c. R Squared = .095 (Adjusted R Squared = .049)
- d. R Squared = .053 (Adjusted R Squared = .006)
- e. R Squared = .195 (Adjusted R Squared = .155)
- f. R Squared = .132 (Adjusted R Squared = .089)
- g. R Squared = .051 (Adjusted R Squared = .003)
- h. R Squared = .193 (Adjusted R Squared = .152)

Face-to-face vs. Internet Therapy Analyses: Post-Follow-up Results (MANOVA)

**General Linear Model - FTF vs. IT (post-follow-up)**

**Between-Subjects Factors**

		Value Label	N
face-to-face vs. Internet	.00	face-to-face	13
therapy condition	1.00	Internet therapy	8

**Multivariate Tests<sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.716	3.786 <sup>a</sup>	8.000	12.000	.019
	Wilks' Lambda	.284	3.786 <sup>a</sup>	8.000	12.000	.019
	Hotelling's Trace	2.524	3.786 <sup>a</sup>	8.000	12.000	.019
	Roy's Largest Root	2.524	3.786 <sup>a</sup>	8.000	12.000	.019
tmtgrp	Pillai's Trace	.492	1.453 <sup>a</sup>	8.000	12.000	.270
	Wilks' Lambda	.508	1.453 <sup>a</sup>	8.000	12.000	.270
	Hotelling's Trace	.969	1.453 <sup>a</sup>	8.000	12.000	.270
	Roy's Largest Root	.969	1.453 <sup>a</sup>	8.000	12.000	.270

a. Exact statistic

b. Design: Intercept+tmtgrp

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxpostfup	11.869 <sup>a</sup>	1	11.869	1.579	.224
	deppostfup	7.858 <sup>b</sup>	1	7.858	1.224	.282
	acqpostfup	.011 <sup>c</sup>	1	.011	.073	.790
	bsqpostfup	.180 <sup>d</sup>	1	.180	1.596	.222
	miaccpostfu	.009 <sup>e</sup>	1	.009	.151	.701
	mialpostfu	.030 <sup>f</sup>	1	.030	.195	.664
	miwkpostfup	1.935 <sup>g</sup>	1	1.935	.307	.586
	sevpostfup	.003 <sup>h</sup>	1	.003	.009	.923
Intercept	anxpostfup	161.011	1	161.011	21.423	.000
	deppostfup	11.286	1	11.286	1.758	.201
	acqpostfup	.190	1	.190	1.287	.271
	bsqpostfup	.567	1	.567	5.015	.037
	miaccpostfu	.152	1	.152	2.553	.127
	mialpostfu	.361	1	.361	2.363	.141
	miwkpostfup	9.363	1	9.363	1.484	.238
	sevpostfup	5.203	1	5.203	15.958	.001
tmtgrp	anxpostfup	11.869	1	11.869	1.579	.224
	deppostfup	7.858	1	7.858	1.224	.282
	acqpostfup	.011	1	.011	.073	.790
	bsqpostfup	.180	1	.180	1.596	.222
	miaccpostfu	.009	1	.009	.151	.701
	mialpostfu	.030	1	.030	.195	.664
	miwkpostfup	1.935	1	1.935	.307	.586
	sevpostfup	.003	1	.003	.009	.923
Error	anxpostfup	142.798	19	7.516		
	deppostfup	121.952	19	6.419		
	acqpostfup	2.804	19	.148		
	bsqpostfup	2.148	19	.113		
	miaccpostfu	1.127	19	.059		
	mialpostfu	2.905	19	.153		
	miwkpostfup	119.875	19	6.309		
	sevpostfup	6.195	19	.326		
Total	anxpostfup	304.000	21			
	deppostfup	147.000	21			
	acqpostfup	2.994	21			
	bsqpostfup	3.102	21			
	miaccpostfu	1.279	21			
	mialpostfu	3.373	21			
	miwkpostfup	134.000	21			
	sevpostfup	11.650	21			
Corrected Total	anxpostfup	154.667	20			
	deppostfup	129.810	20			
	acqpostfup	2.815	20			
	bsqpostfup	2.329	20			
	miaccpostfu	1.136	20			
	mialpostfu	2.935	20			
	miwkpostfup	121.810	20			
	sevpostfup	6.198	20			

- a. R Squared = .077 (Adjusted R Squared = .028)
- b. R Squared = .061 (Adjusted R Squared = .011)
- c. R Squared = .004 (Adjusted R Squared = -.049)
- d. R Squared = .077 (Adjusted R Squared = .029)
- e. R Squared = .008 (Adjusted R Squared = -.044)
- f. R Squared = .010 (Adjusted R Squared = -.042)
- g. R Squared = .016 (Adjusted R Squared = -.036)
- h. R Squared = .000 (Adjusted R Squared = -.052)

**Intention to Treat Analyses**  
**Face-to-face Analyses: Pre-post Result (MANOVA)**  
 General Linear Model – ITT: FTF (pre-post)

**Multivariate Tests <sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.884	6.640 <sup>a</sup>	8.000	7.000	.011
	Wilks' Lambda	.116	6.640 <sup>a</sup>	8.000	7.000	.011
	Hotelling's Trace	7.588	6.640 <sup>a</sup>	8.000	7.000	.011
	Roy's Largest Root	7.588	6.640 <sup>a</sup>	8.000	7.000	.011

a. Exact statistic

b. Design: Intercept

**Tests of Between-Subjects Effects**

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxprepost	.000 <sup>a</sup>	0	.	.	.
	depprepost	.000 <sup>a</sup>	0	.	.	.
	ACQprepost	.000 <sup>a</sup>	0	.	.	.
	BSQprepost	.000 <sup>a</sup>	0	.	.	.
	Mlaccprepost	.000 <sup>a</sup>	0	.	.	.
	Mlalprepost	.000 <sup>a</sup>	0	.	.	.
	nopanwkprepost	.000 <sup>a</sup>	0	.	.	.
	sevprepost	.000 <sup>a</sup>	0	.	.	.
Intercept	anxprepost	3435.267	1	3435.267	37.117	.000
	depprepost	1749.600	1	1749.600	50.566	.000
	ACQprepost	10.070	1	10.070	15.618	.001
	BSQprepost	14.940	1	14.940	26.636	.000
	Mlaccprepost	7.690	1	7.690	10.590	.006
	Mlalprepost	10.350	1	10.350	20.581	.000
	nopanwkprepost	273.067	1	273.067	3.645	.077
	sevprepost	22.326	1	22.326	40.572	.000
Error	anxprepost	1295.733	14	92.552		
	depprepost	484.400	14	34.600		
	ACQprepost	9.027	14	.645		
	BSQprepost	7.853	14	.561		
	Mlaccprepost	10.166	14	.726		
	Mlalprepost	7.041	14	.503		
	nopanwkprepost	1048.933	14	74.924		
	sevprepost	7.704	14	.550		
Total	anxprepost	4731.000	15			
	depprepost	2234.000	15			
	ACQprepost	19.096	15			
	BSQprepost	22.793	15			
	Mlaccprepost	17.856	15			
	Mlalprepost	17.391	15			
	nopanwkprepost	1322.000	15			
	sevprepost	30.030	15			
Corrected Total	anxprepost	1295.733	14			
	depprepost	484.400	14			
	ACQprepost	9.027	14			
	BSQprepost	7.853	14			
	Mlaccprepost	10.166	14			
	Mlalprepost	7.041	14			
	nopanwkprepost	1048.933	14			
	sevprepost	7.704	14			

a. R Squared = .000 (Adjusted R Squared = .000)

**Face-to-face Analyses: Post-Follow-up Results (MANOVA)**  
**General Linear Model - ITT: FTF (Post-Follow-up)**

**Multivariate Tests<sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.833	4.380 <sup>a</sup>	8.000	7.000	.033
	Wilks' Lambda	.167	4.380 <sup>a</sup>	8.000	7.000	.033
	Hotelling's Trace	5.006	4.380 <sup>a</sup>	8.000	7.000	.033
	Roy's Largest Root	5.006	4.380 <sup>a</sup>	8.000	7.000	.033

a. Exact statistic

b. Design: Intercept

**Tests of Between-Subjects Effects**

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxpostfup	.000 <sup>a</sup>	0	.	.	.
	deppostfup	.000 <sup>a</sup>	0	.	.	.
	acqpostfup	.000 <sup>a</sup>	0	.	.	.
	bsqpostfup	.000 <sup>a</sup>	0	.	.	.
	miaccpostfup	.000 <sup>a</sup>	0	.	.	.
	mialpostfup	.000 <sup>a</sup>	0	.	.	.
	minowkpostfup	.000 <sup>a</sup>	0	.	.	.
	sevpostfup	.000 <sup>a</sup>	0	.	.	.
Intercept	anxpostfup	48.600	1	48.600	14.058	.002
	deppostfup	21.600	1	21.600	3.670	.076
	acqpostfup	.063	1	.063	.339	.570
	bsqpostfup	.789	1	.789	7.275	.017
	miaccpostfup	.049	1	.049	1.678	.216
	mialpostfup	.341	1	.341	2.262	.155
	minowkpostfup	11.267	1	11.267	1.340	.266
	sevpostfup	2.817	1	2.817	8.331	.012
Error	anxpostfup	48.400	14	3.457		
	deppostfup	82.400	14	5.886		
	acqpostfup	2.591	14	.185		
	bsqpostfup	1.518	14	.108		
	miaccpostfup	.411	14	.029		
	mialpostfup	2.107	14	.151		
	minowkpostfup	117.733	14	8.410		
	sevpostfup	4.733	14	.338		
Total	anxpostfup	97.000	15			
	deppostfup	104.000	15			
	acqpostfup	2.654	15			
	bsqpostfup	2.307	15			
	miaccpostfup	.461	15			
	mialpostfup	2.448	15			
	minowkpostfup	129.000	15			
	sevpostfup	7.550	15			
Corrected Total	anxpostfup	48.400	14			
	deppostfup	82.400	14			
	acqpostfup	2.591	14			
	bsqpostfup	1.518	14			
	miaccpostfup	.411	14			
	mialpostfup	2.107	14			
	minowkpostfup	117.733	14			
	sevpostfup	4.733	14			

a. R Squared = .000 (Adjusted R Squared = .000)

**Internet Therapy Analyses: Pre-Post Results (MANOVA)**  
**General Linear Model ITT: IT (pre-post)**

**Multivariate Tests<sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.533	1.000 <sup>a</sup>	8.000	7.000	.507
	Wilks' Lambda	.467	1.000 <sup>a</sup>	8.000	7.000	.507
	Hotelling's Trace	1.143	1.000 <sup>a</sup>	8.000	7.000	.507
	Roy's Largest Root	1.143	1.000 <sup>a</sup>	8.000	7.000	.507

a. Exact statistic

b. Design: Intercept

**Tests of Between-Subjects Effects**

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxprepost	.000 <sup>a</sup>	0	.	.	.
	depprepost	.000 <sup>a</sup>	0	.	.	.
	ACQprepost	.000 <sup>a</sup>	0	.	.	.
	BSQprepost	.000 <sup>a</sup>	0	.	.	.
	Mlaccprepost	.000 <sup>a</sup>	0	.	.	.
	Mlalprepost	.000 <sup>a</sup>	0	.	.	.
	nopanwkprepost	.000 <sup>a</sup>	0	.	.	.
	sevprepost	.000 <sup>a</sup>	0	.	.	.
Intercept	anxprepost	201.667	1	201.667	6.016	.028
	depprepost	86.400	1	86.400	1.719	.211
	ACQprepost	.687	1	.687	2.866	.113
	BSQprepost	2.489	1	2.489	9.109	.009
	Mlaccprepost	.021	1	.021	.477	.501
	Mlalprepost	.475	1	.475	1.490	.242
	nopanwkprepost	6.667	1	6.667	3.415	.086
	sevprepost	2.166	1	2.166	9.123	.009
Error	anxprepost	469.333	14	33.524		
	depprepost	703.600	14	50.257		
	ACQprepost	3.356	14	.240		
	BSQprepost	3.825	14	.273		
	Mlaccprepost	.613	14	.044		
	Mlalprepost	4.466	14	.319		
	nopanwkprepost	27.333	14	1.952		
	sevprepost	3.324	14	.237		
Total	anxprepost	671.000	15			
	depprepost	790.000	15			
	ACQprepost	4.043	15			
	BSQprepost	6.314	15			
	Mlaccprepost	.634	15			
	Mlalprepost	4.941	15			
	nopanwkprepost	34.000	15			
	sevprepost	5.490	15			
Corrected Total	anxprepost	469.333	14			
	depprepost	703.600	14			
	ACQprepost	3.356	14			
	BSQprepost	3.825	14			
	Mlaccprepost	.613	14			
	Mlalprepost	4.466	14			
	nopanwkprepost	27.333	14			
	sevprepost	3.324	14			

a. R Squared = .000 (Adjusted R Squared = .000)



**Internet Therapy Analyses: Post-Follow-up Analyses (MANOVA)**  
**General Linear Model - ITT: IT (post-follow-up)**

**Multivariate Tests <sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.467	1.000 <sup>a</sup>	7.000	8.000	.493
	Wilks' Lambda	.533	1.000 <sup>a</sup>	7.000	8.000	.493
	Hotelling's Trace	.875	1.000 <sup>a</sup>	7.000	8.000	.493
	Roy's Largest Root	.875	1.000 <sup>a</sup>	7.000	8.000	.493

a. Exact statistic

b. Design: Intercept

**Tests of Between-Subjects Effects**

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxpostfup	.000 <sup>a</sup>	0	.	.	.
	deppostfup	.000 <sup>a</sup>	0	.	.	.
	acqpostfup	.000 <sup>a</sup>	0	.	.	.
	bsqpostfup	.000 <sup>a</sup>	0	.	.	.
	miaccpostfup	.000 <sup>a</sup>	0	.	.	.
	mialpostfup	.000 <sup>a</sup>	0	.	.	.
	minowkpostfup	.000 <sup>a</sup>	0	.	.	.
	sevpostfup	.000 <sup>a</sup>	0	.	.	.
Intercept	anxpostfup	56.067	1	56.067	5.201	.039
	deppostfup	.067	1	.067	.022	.885
	acqpostfup	.063	1	.063	3.168	.097
	bsqpostfup	.023	1	.023	.421	.527
	miaccpostfup	.050	1	.050	.920	.354
	mialpostfup	.040	1	.040	.625	.442
	minowkpostfup	.600	1	.600	1.909	.189
	sevpostfup	1.176	1	1.176	5.631	.033
Error	anxpostfup	150.933	14	10.781		
	deppostfup	42.933	14	3.067		
	acqpostfup	.277	14	.020		
	bsqpostfup	.772	14	.055		
	miaccpostfup	.768	14	.055		
	mialpostfup	.885	14	.063		
	minowkpostfup	4.400	14	.314		
	sevpostfup	2.924	14	.209		
Total	anxpostfup	207.000	15			
	deppostfup	43.000	15			
	acqpostfup	.340	15			
	bsqpostfup	.795	15			
	miaccpostfup	.818	15			
	mialpostfup	.925	15			
	minowkpostfup	5.000	15			
	sevpostfup	4.100	15			
Corrected Total	anxpostfup	150.933	14			
	deppostfup	42.933	14			
	acqpostfup	.277	14			
	bsqpostfup	.772	14			
	miaccpostfup	.768	14			
	mialpostfup	.885	14			
	minowkpostfup	4.400	14			
	sevpostfup	2.924	14			

a. R Squared = .000 (Adjusted R Squared = .000)

Face-to-face Therapy vs. Internet Therapy: Pre-Post Results (MANOVA)

**General Linear Model ITT: FTF v IT (pre-post)**

**Between-Subjects Factors**

	Value Label	N
face-to-face vs. Internet therapy condition	.00	15
	1.00	15
	face-to-face	
	Internet therapy	

**Multivariate Tests<sup>b</sup>**

Effect	Value	F	Hypothesis df	Error df	Sig.	
Intercept	Pillai's Trace	.730	7.102 <sup>a</sup>	8.000	21.000	.000
	Wilks' Lambda	.270	7.102 <sup>a</sup>	8.000	21.000	.000
	Hotelling's Trace	2.705	7.102 <sup>a</sup>	8.000	21.000	.000
	Roy's Largest Root	2.705	7.102 <sup>a</sup>	8.000	21.000	.000
tmtgrp	Pillai's Trace	.516	2.800 <sup>a</sup>	8.000	21.000	.028
	Wilks' Lambda	.484	2.800 <sup>a</sup>	8.000	21.000	.028
	Hotelling's Trace	1.067	2.800 <sup>a</sup>	8.000	21.000	.028
	Roy's Largest Root	1.067	2.800 <sup>a</sup>	8.000	21.000	.028

a. Exact statistic

b. Design: Intercept+tmtgrp

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxprepost	986.133 <sup>a</sup>	1	986.133	15.643	.000
	depprepost	529.200 <sup>b</sup>	1	529.200	12.473	.001
	ACQprepost	2.748 <sup>c</sup>	1	2.748	6.214	.019
	BSQprepost	2.617 <sup>d</sup>	1	2.617	6.274	.018
	Mlaccprepost	3.454 <sup>e</sup>	1	3.454	8.973	.006
	Mlalprepost	3.195 <sup>f</sup>	1	3.195	7.774	.009
	nopanwkprepost	97.200 <sup>g</sup>	1	97.200	2.529	.123
	sevprepost	5.292 <sup>h</sup>	1	5.292	13.436	.001
Intercept	anxprepost	2650.800	1	2650.800	42.051	.000
	depprepost	1306.800	1	1306.800	30.800	.000
	ACQprepost	8.008	1	8.008	18.109	.000
	BSQprepost	14.812	1	14.812	35.515	.000
	Mlaccprepost	4.256	1	4.256	11.056	.002
	Mlalprepost	7.631	1	7.631	18.568	.000
	nopanwkprepost	182.533	1	182.533	4.749	.038
	sevprepost	19.200	1	19.200	48.749	.000
tmtgrp	anxprepost	986.133	1	986.133	15.643	.000
	depprepost	529.200	1	529.200	12.473	.001
	ACQprepost	2.748	1	2.748	6.214	.019
	BSQprepost	2.617	1	2.617	6.274	.018
	Mlaccprepost	3.454	1	3.454	8.973	.006
	Mlalprepost	3.195	1	3.195	7.774	.009
	nopanwkprepost	97.200	1	97.200	2.529	.123
	sevprepost	5.292	1	5.292	13.436	.001
Error	anxprepost	1765.067	28	63.038		
	depprepost	1188.000	28	42.429		
	ACQprepost	12.383	28	.442		
	BSQprepost	11.678	28	.417		
	Mlaccprepost	10.779	28	.385		
	Mlalprepost	11.507	28	.411		
	nopanwkprepost	1076.267	28	38.438		
	sevprepost	11.028	28	.394		
Total	anxprepost	5402.000	30			
	depprepost	3024.000	30			
	ACQprepost	23.139	30			
	BSQprepost	29.107	30			
	Mlaccprepost	18.490	30			
	Mlalprepost	22.332	30			
	nopanwkprepost	1356.000	30			
	sevprepost	35.520	30			
Corrected Total	anxprepost	2751.200	29			
	depprepost	1717.200	29			
	ACQprepost	15.131	29			
	BSQprepost	14.295	29			
	Mlaccprepost	14.233	29			
	Mlalprepost	14.702	29			
	nopanwkprepost	1173.467	29			
	sevprepost	16.320	29			

- a. R Squared = .358 (Adjusted R Squared = .336)
- b. R Squared = .308 (Adjusted R Squared = .283)
- c. R Squared = .182 (Adjusted R Squared = .152)
- d. R Squared = .183 (Adjusted R Squared = .154)
- e. R Squared = .243 (Adjusted R Squared = .216)
- f. R Squared = .217 (Adjusted R Squared = .189)
- g. R Squared = .083 (Adjusted R Squared = .050)
- h. R Squared = .324 (Adjusted R Squared = .300)

Face-to-face vs. Internet Therapy Analyses: Post-Follow-up Results (MANOVA)

**General Linear Model ITT: FTF vs. IT (post-follow-up)**

**Between-Subjects Factors**

		Value Label	N
face-to-face vs. Internet therapy condition	.00	face-to-face	15
	1.00	Internet therapy	15

**Multivariate Tests<sup>b</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.567	3.439 <sup>a</sup>	8.000	21.000	.011
	Wilks' Lambda	.433	3.439 <sup>a</sup>	8.000	21.000	.011
	Hotelling's Trace	1.310	3.439 <sup>a</sup>	8.000	21.000	.011
	Roy's Largest Root	1.310	3.439 <sup>a</sup>	8.000	21.000	.011
tmtgrp	Pillai's Trace	.435	2.021 <sup>a</sup>	8.000	21.000	.094
	Wilks' Lambda	.565	2.021 <sup>a</sup>	8.000	21.000	.094
	Hotelling's Trace	.770	2.021 <sup>a</sup>	8.000	21.000	.094
	Roy's Largest Root	.770	2.021 <sup>a</sup>	8.000	21.000	.094

a. Exact statistic

b. Design: Intercept+tmtgrp

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	anxpostfup	.133 <sup>a</sup>	1	.133	.019	.892
	deppostfup	9.633 <sup>b</sup>	1	9.633	2.152	.154
	acqpostfup	8.882E-16 <sup>c</sup>	1	8.882E-16	.000	1.000
	bsqpostfup	.271 <sup>d</sup>	1	.271	3.311	.080
	miaccpostfup	3.333E-06 <sup>c</sup>	1	3.333E-06	.000	.993
	mialpostfup	.074 <sup>e</sup>	1	.074	.692	.412
	minowkpostfup	3.333 <sup>f</sup>	1	3.333	.764	.389
	sevpostfup	.176 <sup>g</sup>	1	.176	.645	.429
Intercept	anxpostfup	104.533	1	104.533	14.684	.001
	deppostfup	12.033	1	12.033	2.688	.112
	acqpostfup	.125	1	.125	1.225	.278
	bsqpostfup	.541	1	.541	6.620	.016
	miaccpostfup	.100	1	.100	2.369	.135
	mialpostfup	.306	1	.306	2.863	.102
	minowkpostfup	8.533	1	8.533	1.956	.173
	sevpostfup	3.816	1	3.816	13.955	.001
tmtgrp	anxpostfup	.133	1	.133	.019	.892
	deppostfup	9.633	1	9.633	2.152	.154
	acqpostfup	.000	1	.000	.000	1.000
	bsqpostfup	.271	1	.271	3.311	.080
	miaccpostfup	3.333E-06	1	3.333E-06	.000	.993
	mialpostfup	.074	1	.074	.692	.412
	minowkpostfup	3.333	1	3.333	.764	.389
	sevpostfup	.176	1	.176	.645	.429
Error	anxpostfup	199.333	28	7.119		
	deppostfup	125.333	28	4.476		
	acqpostfup	2.868	28	.102		
	bsqpostfup	2.290	28	.082		
	miaccpostfup	1.179	28	.042		
	mialpostfup	2.992	28	.107		
	minowkpostfup	122.133	28	4.362		
	sevpostfup	7.657	28	.273		
Total	anxpostfup	304.000	30			
	deppostfup	147.000	30			
	acqpostfup	2.994	30			
	bsqpostfup	3.102	30			
	miaccpostfup	1.279	30			
	mialpostfup	3.373	30			
	minowkpostfup	134.000	30			
	sevpostfup	11.650	30			
Corrected Total	anxpostfup	199.467	29			
	deppostfup	134.967	29			
	acqpostfup	2.868	29			
	bsqpostfup	2.561	29			
	miaccpostfup	1.179	29			
	mialpostfup	3.066	29			
	minowkpostfup	125.467	29			
	sevpostfup	7.834	29			

- a. R Squared = .001 (Adjusted R Squared = -.035)
- b. R Squared = .071 (Adjusted R Squared = .038)
- c. R Squared = .000 (Adjusted R Squared = -.036)
- d. R Squared = .106 (Adjusted R Squared = .074)
- e. R Squared = .024 (Adjusted R Squared = -.011)
- f. R Squared = .027 (Adjusted R Squared = -.008)
- g. R Squared = .023 (Adjusted R Squared = -.012)

Working Alliance: Face-to-face vs. Internet Therapy (t-tests)

**T-Test WAI: FTF vs. IT**

**Group Statistics**

face-to-face vs. Internet therapy condition		N	Mean	Std. Deviation	Std. Error Mean
WAlldiffer	face-to-face	14	-2.4286	7.57236	2.02380
	Internet therapy	8	-1.2500	20.78289	7.34786

**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
WAlldiffer	Equal variance assumed	2.569	.125	-.194	20	.848	-1.17857	6.08410	3.86978	11.51264
	Equal variance not assumed			-.155	8.077	.881	-1.17857	7.62147	8.72449	16.36734

Pre-treatment Scores: Dropouts vs. Completers (t-tests)

**T-Test Pre-treatment: Dropouts vs. Completers**

**Group Statistics**

	finished	N	Mean	Std. Deviation	Std. Error Mean
depression score on DASS	no	9	25.4444	12.23837	4.07946
	yes	21	15.0000	7.80385	1.70294
anxiety score on DASS	no	9	25.6667	8.42615	2.80872
	yes	21	22.2381	8.27590	1.80595
Stress score on DASS	no	9	27.5556	10.36956	3.45652
	yes	21	22.6190	7.41941	1.61905
score on ACQ	no	9	2.5211	.81499	.27166
	yes	21	2.3414	.71559	.15616
score on BSQ	no	9	2.7500	1.03493	.34498
	yes	21	2.7829	.71170	.15530
score on mobility inventory accompanied	no	9	2.0033	.90273	.30091
	yes	21	2.0552	.96804	.21124
score on mobility inventory alone	no	9	2.4478	1.32847	.44282
	yes	21	2.5419	.95517	.20843
how many panic attacks in past week	no	9	6.8889	6.41179	2.13726
	yes	21	5.4286	7.49381	1.63528
how many panic attacks in past 3 weeks	no	9	20.8889	19.19274	6.39758
	yes	21	14.0952	21.43806	4.67817
severity of panic attack on mobility inventory	no	9	3.5111	.65659	.21886
	yes	21	3.3952	.78133	.17050

**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
depression score on DASS	1.717	.201	2.822	28	.009	10.44444	3.70100	2.86329	18.02560
			2.363	10.899	.038	10.44444	4.42063	.70365	20.18523
anxiety score on DASS	.036	.851	1.034	28	.310	3.42857	3.31441	-3.36069	10.21783
			1.027	14.959	.321	3.42857	3.33921	-3.69047	10.54762
Stress score on DASS	.430	.517	1.481	28	.150	4.93651	3.33433	-1.89356	11.76658
			1.293	11.671	.221	4.93651	3.81692	-3.40593	13.27894
score on ACQ	.042	.839	.605	28	.550	.17968	.29695	-.42860	.78796
			.573	13.567	.576	.17968	.31335	-.49439	.85376
score on BSQ	.761	.390	-.101	28	.920	-.03286	.32558	-.69978	.63406
			-.087	11.384	.932	-.03286	.37832	-.86212	.79641
score on mobility inventory accompanied	.243	.626	-.137	28	.892	-.05190	.37842	-.82707	.72326
			-.141	16.250	.889	-.05190	.36766	-.83033	.72652
score on mobility inventory alone	1.896	.179	-.220	28	.828	-.09413	.42834	-.97155	.78330
			-.192	11.708	.851	-.09413	.48943	-1.16346	.97520
how many panic attacks in past week	.079	.781	.509	28	.615	1.46032	2.86905	-4.41667	7.33731
			.543	17.684	.594	1.46032	2.69111	-4.20073	7.12137
how many panic attacks in past 3 weeks	.195	.662	.819	28	.420	6.79365	8.29539	-10.19868	23.78599
			.857	16.909	.403	6.79365	7.92555	-9.93465	23.52195
severity of panic attack on mobility inventory	1.241	.275	.389	28	.700	.11587	.29794	-.49442	.72617
			.418	18.004	.681	.11587	.27744	-.46699	.69874



Appendix G

Raw Data (Disk)