

Can radiation therapists detect and manage patients  
experiencing anxiety in the radiation oncology setting?

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A thesis submitted in fulfilment of the requirements for  
the degree of Master of Philosophy

Faculty of Medicine  
The University of Sydney  
Australia  
2018

## STATEMENT OF AUTHENTICATION

This is to certify that, to the best of my knowledge, the content of this thesis is my own work.

This thesis has not been submitted for any degree or other purposes.

I certify that the intellectual content of this thesis is the product of my own work and that all the assistance received in preparing this thesis and sources have been acknowledged in the text.

Signature:



Date:

7 April 2019

## **ACKNOWLEDGEMENTS**

The success of this work is not the responsibility of any one person, but all of us together.

Sam, thank you for understanding the importance of this work to me, even though I did not know where it would lead. Cooper and McKenzie, whom I bored with graphs, presentations and 'blah blah blah'! You understand the importance of what mummy does, and that makes me incredibly proud. You are intelligent, loving and empathetic and your future is bright.

Mum and Dad, thank you for always encouraging me, being proud, and putting up with my 'busyness'!

Haryana Dhillon, Diana Naehrig and Georgia Halkett, my "A" team. You have always created a calm, supportive and united learning environment, in which to share expertise and create. The knowledge, confidence, motivation and inspiration I have gained from you will continue to benefit every aspect of my life. I have grown more than I could imagine. Thank you.

Jenny Cox, many moons ago you convinced me to become a radiation therapist and then developed my interest in research. It only took me 8 years to decide on a research topic that truly resonated with me and that I will continue to be passionate about! Thank you.

Tara Rosewall, Lorrie Hulley and your Canadian colleagues, thank you for your open and collaborative nature and welcoming me in your country.

Heartfelt thanks to the RTs, oncology professionals and organisations who have supported and contributed to this work. You advocate for your patients, endlessly and in a multitude of ways, often during the most challenging circumstances. So many of you have shown strength and motivation to carry this work forward to ensure the people, who find themselves in our hands, receive the best possible care.

Alle, I know I will never truly understand the depths of your despair, but I hope this work helps keep families supported and together. Katie and Bex, through darkness, light will shine.

Asking for help is not a sign of weakness, but a strength of character.

## ABSTRACT

Oncology patients have complex medical needs and treatment regimens, which may be accompanied by high levels of psychosocial distress, anxiety, and depression. Many patients treated with radiation therapy have unmet psychosocial needs which may result in poorer compliance to treatment, self-care, and overall health outcomes.

National and international psychosocial guidelines state all healthcare professionals (HCPs) involved in patient care are responsible for patients' psychosocial well-being. However, multiple studies show HCPs fail to detect and manage patients' psychosocial needs, and patients may not raise these.

Radiation therapists (RTs) are members of the multidisciplinary team who directly interact with oncology patients on a daily basis. The aim of this research was to explore RT ability to detect and manage patient anxiety. A systematic review was conducted, which identified 12 publications related to RT-led interventions to reduce patient anxiety. Subsequently, an online survey was developed to investigate RT values, skills, training and knowledge regarding patient anxiety and psychosocial support.

A cross-sectional survey was designed using qualitative and quantitative items. RTs from Canada, Australia and New Zealand (ANZ) participated. In total, 859 RTs responded, and 582 datasets were analysed. RTs most frequently recognised overt signs of anxiety such as *nervousness/agitation*, endorsed by 304 (95.6%) ANZ and 262 (99.2%) Canadian respondents; and/or *physiological reactions*, endorsed by 239 (75.2%) ANZ and 207 (78.4%) Canadian respondents. In vignette 1, respondents described the patient as *anxious* 553 (95.0%), and/or *worried* 532 (91.4%). In vignette 2, descriptors endorsed were *distressed* 508 (87.3%), *anxious* 505 (86.8%), *angry* 500 (85.9%), and/or *worried* 424 (72.9%). In vignette 1, frequently endorsed strategies to manage anxious patients were *acknowledge and encourage* 548 (94.2%) and/or *discuss referral with patient* 285 (49.0%); and in vignette 2, *acknowledge and encourage* 455, (78.2%); and/or *contact RO/nurse prior to treatment* 450 (77.3%).

This research resulted in the following recommendations:

1. enhance RT knowledge and recognition of less overt signs of anxiety,
2. ensure appropriate training in communication and psychosocial care to enhance RT ability to detect and manage patient anxiety, and
3. increase RT confidence when dealing with patients with anxiety by enabling RTs to provide effective psychosocial care.

## **Author Contributions**

Kelly L. Elsner, BAppSc (MRT), undertook this research with the supervision:

Principal supervisor: Dr. Haryana M. Dhillon, MA (Psych), BSc, PhD; and

Adjunct supervisors: Dr. Diana N. Naehrig, Dr Med, MSc Coach Psych; Dr. Georgia K.B. Halkett, PhD, FASMIRT, BMedRad (Hons).

Author contributions were:

Chapter 1 – Introduction

This is my original work.

Chapter 2 – Systematic review

This is my original work. I defined methodology and criteria with Haryana Dhillon, Diana Naehrig and Georgia Halkett. I conducted the literature search and conducted title, abstract and methodology analysis with Haryana Dhillon; quality assessment, interpretation of literature and gap analysis was a collaboration between Haryana Dhillon, Diana Naehrig, Georgia Halkett and I. I formulated the systematic review discussion.

Chapter 3 – Methods

I initiated the study concept, aims and objectives. I conducted the research design in collaboration with Haryana Dhillon, Diana Naehrig and Georgia Halkett.

I formed the survey concept and design in collaboration with Haryana Dhillon, Diana Naehrig and Georgia Halkett. Dr. Tara Rosewall and Lorraine Hulley provided reference materials to assist survey development.

Haryana Dhillon and I were responsible for the Human Research Ethics Committee (HREC) application, conduct of the study, data collection, storage and use.

#### Chapter 4 – Results

I conducted data and statistical analysis under the guidance of Haryana Dhillon. I conducted results interpretation in collaboration with Haryana Dhillon, Diana Naehrig and Georgia Halkett.

#### Chapter 5 – Discussion and Recommendations

This is my original work.

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## **PUBLICATIONS ARISING FROM THESIS**

Elsner K, Naehrig D, Halkett G, Dhillon H. Reduced patient anxiety as a result of radiation therapist-led psychosocial support: a systematic review. *J Med Radiat Sci* 2017; 64 (3):220-31. doi:10.1002/jmrs.208 (See Appendix 1).

This is my original work. Methodology and criteria were defined as a collaboration between Haryana Dhillon, Diana Naehrig, Georgia Halkett and I. I conducted a literature search, title, abstract and methodology analysis with Haryana Dhillon; quality assessment, interpretation of literature and gap analysis was a collaboration between Haryana Dhillon, Diana Naehrig, Georgia Halkett and I. I formulated the discussion and drafted the manuscript with significant contributions from Haryana Dhillon, Diana Naehrig and Georgia Halkett.

Elsner K, Naehrig D, Halkett G, Dhillon H. Development and pilot of an international survey: 'Radiation Therapists and Psychosocial Support'. *J Med Radiat Sci* 2018; 65 (3):209-217. doi:10.1002/jmrs.286 (See Appendix 2).

This is my original work and I initiated the concept. I conducted a literature gap analysis resulting from a systematic review in collaboration with Haryana Dhillon, Diana Naehrig and Georgia Halkett. I developed the survey in collaboration with Haryana Dhillon, Diana Naehrig and Georgia Halkett. Haryana Dhillon initiated pilot testing, and methodology was defined in collaboration with Diana Naehrig, Georgia Halkett and I. I conducted results analysis, interpretation and reporting under the guidance of Haryana Dhillon. I drafted the manuscript with significant contributions from Haryana Dhillon, Diana Naehrig and Georgia Halkett.

## PRESENTATIONS AT SCIENTIFIC MEETINGS

### International

Elsner K, Naehrig D, Halkett G, Dhillon H. Do radiation therapists recognise anxious patients in the radiation oncology treatment setting? *Australian Society of Medical Imaging and Radiation Therapy (ASMIRT): 15-18 March 2018; Canberra, Australia. Oral presentation.*

Elsner K, Naehrig D, Halkett G, Dhillon H. What do Radiation Therapists Know About Patient Anxiety? International Results. *Canadian Association of Medical Radiation Technologists – Ontario Association of Medical Radiation Sciences (CAMRT-OAMRS) Annual General Conference: 27-30 April 2017; Ottawa, Canada. Oral presentation.*

Elsner K, Naehrig D, Halkett G, Dhillon H. What do RTs in Australia, NZ and Canada know about patient anxiety? Survey Results. *Australian Society of Medical Imaging and Radiation Therapy (ASMIRT): 24-26 March 2017; Perth, Australia. Oral presentation.*

Elsner K, Naehrig D, Halkett G, Dhillon H. What do RTs in Australia, NZ and Canada know about patient anxiety? Survey Results. *Annual Scientific Meeting of Medical Imaging and Radiation Therapy (ASMMIRT): 22-24 April 2016; Brisbane, Australia. Oral presentation.*

### National

Elsner K, Naehrig D, Halkett G, Dhillon H. What do Radiation Therapists know about patient anxiety? International survey results. *Innovations in Cancer Treatment and Care Cancer: 14 September 2017; Sydney, Australia. Oral presentation.*

Elsner K, Naehrig D, Halkett G, Dhillon H. Piloting an international survey investigating Radiation Therapists' (RTs) knowledge and management of patients with anxiety. *Innovations in Cancer Treatment and Care Cancer: 16 September 2016; Sydney, Australia. Oral presentation. Winner of best in session oral presentation.*

## **ABBREVIATIONS**

AGC	Annual General Conference
AHPRA	Australian Health Practitioner Regulation Agency
ANZ	Australia and New Zealand
ANZMRRN	Australia New Zealand Medical Radiations Research Network
ASAP	As Soon As Possible
ASMIRT	Australian Society of Medical Imaging and Radiation Therapy
ASMMIRT	Annual Scientific Meeting of Medical Imaging and Radiation Therapy
CAMRT	Canadian Association of Medical Radiation Technologists
CIHI	Canadian Institute for Health Information
CPD	Continuing Professional Development
CST	Communication Skills Training
CT	Computed Tomography
DNA	Did Not Answer
HADS	Hospital Anxiety and Depression Scale
HCP	Healthcare Professionals
Linac	Linear Accelerator
MRPB	Medical Radiation Practice Board
NCCN	National Comprehensive Cancer Network
NZ	New Zealand

NZIMRT	New Zealand Institute of Medical Radiation Technology
NZMRTB	New Zealand Medical Radiation Technology Board
OAMRS	Ontario Association of Medical Radiation Sciences
PICO	Population, Intervention, Comparison, Outcome
PIS	Participant Information Statement
PNA	Prefer Not to Answer
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines
RCT	Randomised Control Trial
RO	Radiation Oncologist
RON	Radiation Oncology Nurse
RT	Radiation Therapist
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
Tx	Radiation therapy treatment
VERT	Virtual Environment for Radiation Therapy training

## **CHAPTER 1. INTRODUCTION**

### **1.1. Background**

All patients diagnosed with cancer are likely to experience varying levels of distress throughout their cancer journey (1, 2). Distress in cancer is defined as a “multifactorial unpleasant emotional experience of a psychological (i.e. cognitive, behavioural, emotional), social, spiritual and/or physical nature that may interfere with the ability to cope effectively with cancer, its physical symptoms and its treatment” (1). Distress is a broad term encompassing normal feelings of vulnerability, sadness, anger and fear, to disabling existential crises, depression, or anxiety (1, 2).

This research focusses on ‘anxiety’ defined as a state of worry or fear of an internal or external threat, combined with symptoms of physical tension such as heightened physical arousal, agitation, anger sleep disturbance, and impaired concentration and decision-making (2). Anxiety can range from mild to severe and impact on everyday functioning related to health, well-being, relationships, social interactions and occupation (2, 3).

Anxiety may be a short-term response to a situation or set of circumstances such as a cancer diagnosis. In fact, anxiety is commonly observed amongst patients presenting to radiation oncology (4, 5). Typically, anxiety is higher pre-treatment i.e. at initial specialist appointments, radiation planning and first treatment (6-9). Anxiety usually eases as the patient’s level of comfort and perception of safety increases and this can be facilitated by a supportive environment, trusting patient-professional relationships, sharing information, providing patient education, expressing compassion and empathy, and replacing fear of the unknown with familiarity of a daily treatment routine (7, 10-13). However, not all anxiety will resolve.

Anxiety is one of many psychosocial concerns. The term ‘psychosocial’ refers to both psychological and social behaviours, but is more broadly expanded in this context to include concerns regarding physical, practical, psychological, emotional and spiritual domains (2). Patients with unresolved anxiety and psychosocial concerns may require assessment and

interventions from qualified professionals to minimise the potential impact on decision making, self-care, access to and compliance with medical care, satisfaction with care, treatment outcomes, and quality of life (2).

Multiple studies report healthcare professionals (HCPs) do not uniformly detect or explore oncology patients' psychosocial needs, and patients may not express these needs to HCPs. This can result in failures to meet needs during and after cancer-related treatment (2, 9, 14-16). Mackenzie et al conducted a survey of 344 radiation therapy patients, 45% of whom perceived better care across psychosocial and self-care domains would have improved well-being and reduced unmet needs throughout radiation therapy (17). The issue of unmet psychosocial needs in oncology is reportedly common and as a result psychosocial care is a focus of research and system improvement initiatives (2, 3, 18). Improving communication skills training (CST) for HCPs is one initiative to improve ability to elicit patient concerns. Studies of CST have primarily featured medical oncology physicians and nurses (14, 19-22). However, studies assessing CST training tailored to the needs of radiation therapists (RTs) and radiation oncology patients, and RT ability to deliver psychosocial interventions are emerging (13, 23, 24).

Radiation oncology centres are resourced by multidisciplinary teams working collaboratively to tailor care to patients' needs. Typically, radiation oncologists (ROs), radiation oncology nurses (RONs), RTs, and various allied HCPs interact with patients and share duties for overall patient care and well-being, education, advocacy, referrals and co-ordination of care (25). Additionally, HCPs have their own areas of technical expertise. ROs are medical specialists in the use of radiation to treat cancer and related symptoms. ROs assess patients, recommend a medical course of action, prescribe the radiation oncology component of treatment, identify and delineate target volumes and organs at risk, evaluate progress and conduct follow up assessments (26). RONs support the patient and radiation oncology team with patient-related health and risk assessments, and management of medications, side-effects, co-morbidities, medical tests, wound care, emergency care and hospital admissions (25, 26). RTs conduct patient simulation sessions to gather information for treatment

planning; collate and register diagnostic and treatment related imaging, design radiation treatment plans in consultation with ROs and medical physicists, operate technical equipment to deliver treatment and, interact with patients daily to facilitate practicalities of treatment and patient care(26, 27). RT roles in Australia, New Zealand (NZ) and Canada are similarly defined by governing bodies using capability frameworks and professional standards (27).

Psycho-oncology professionals are vital members of the oncology team with specific expertise identifying and managing psychological, social, behavioural and emotional needs influencing quality of life and well-being. Australian clinical pathway guidelines recommend all oncology patients be screened by appropriately trained HCPs at multiple time points throughout their care using standardised screening tools. Tools recommended for screening patients are the Edmonton Symptom Assessment System (ESAS-R) in conjunction with the Canadian Problem Checklist, or the National Comprehensive Cancer Network (NCCN) Distress Thermometer (DT) with the Problem List. To assess clinical levels of anxiety and depression the Hospital Anxiety and Depression Scale (HADS) is recommended. In addition, all oncology patients must have access to appropriately trained HCPs to provide evidence-based interventions and effective management of psychosocial concerns (3). However, it is acknowledged psycho-oncology services vary in terms of staff, qualifications, accessibility and resources (3, 16, 28).

Multidisciplinary collaboration is recommended to effectively communicate, screen, assess, triage and manage patients, therefore improving service utilisation and timely access (2, 28-32). ROs, RONS, and RTs whilst experts in their respective fields, should have sufficient knowledge of anxiety (and psychosocial needs) to enable informal screening and monitoring during routine interactions and discussions with patients (3, 18).

RTs view involvement in psychosocial care as a central component of their role, enhanced by daily engagement with patients (33-37). Daily RT-patient engagement is unique in the

radiation oncology setting and creates multiple opportunities to observe patients and provide psychosocial support.

This research aimed to determine if RTs have sufficient knowledge and skills to detect and manage patients with anxiety in a radiation oncology setting. It was conducted in three stages: systematic review, survey development and pilot, and cross-sectional survey. The overarching aim was broken into three objectives:

1. to explore if RTs have adequate knowledge to detect and manage patients experiencing anxiety;
2. to explore if RTs receive training to effectively detect and manage patients experiencing anxiety; and
3. to explore if RTs have confidence in their ability to communicate effectively with patients experiencing anxiety.

Secondary aims were to explore the effect of individual characteristics on ability to detect and manage anxiety, including country of practice, years of experience, training completed, and personal experience with anxiety.

Research results may unite radiation oncology, medical oncology, psycho-oncology, supportive care, hospital administration, consumer groups and other key stakeholders to identify knowledge and service gaps, and to target training and system improvements to enhance psychosocial care across oncology, including needs related to anxiety.

## **1.2. Thesis structure**

Chapter 1 introduces this research including aims and objectives.

Chapter 2 details the systematic review of the RT role in providing psychosocial support to patients having radiation therapy.

Chapter 3 focuses on survey methodology, including development and pilot.

Chapter 4 presents results of the cross-sectional survey assessing RT skills, training, values, knowledge of anxiety, and ability to detect and manage patient anxiety.

Chapter 5 discusses survey results and contextualises findings within existing literature. It includes recommendations related to system change to improve RT engagement, education, skills, support, self-care and provision of psychosocial support.

## **CHAPTER 2. SYSTEMATIC REVIEW**

Note: The complete systematic review publication is included as Appendix 1.

### **2.1. Background**

It is widely documented that up to 49% of patients attending radiation oncology appointments may experience anxiety and distress, which is heightened during the first few visits (5, 38-40). During these visits, patients meet many HCPs, including ROs, RTs and RONS. The RTs' primary roles are patient care, radiation planning and treatment delivery, but also incorporates patient education, including explanation and co-ordination of procedures and appointments, and providing advice regarding personal care during treatment (41). In fulfilling these roles, RTs need to spend time with patients to ensure their information needs are met and they are willing to proceed with treatment (9, 38). Consequently, RTs have a role in providing psychosocial support to patients, but this role is not well defined.

RTs are the only HCPs in direct daily contact with patients during treatment, placing them in a unique position to explore patients' psychosocial needs (4, 31). Up to one third of patients treated with radiation therapy have been identified as having unmet psychosocial needs (17). These unmet needs can result in refusal to undergo radiation therapy, treatment delays, reduced compliance, low adherence to medical advice, decreased quality of life, decreased satisfaction with services and increased resource use (19, 40). It may be possible to improve quality of care for patients treated with radiation therapy by addressing their unmet psychosocial needs; however, there have been few studies and no systematic reviews.

This systematic review aimed to identify literature regarding the effect of RT-led psychosocial support on patient anxiety and synthesise evidence related to:

- RTs providing psychosocial support to patients in clinical practice
- The effect of psychosocial support provided by RTs in reducing patient anxiety, depression or stress
- Feasibility of psycho-social support interventions incorporated in RT clinical practice

This review complies with Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (42).

## **2.2. Search Strategy**

This search was conducted in May 2015. Qualitative and quantitative studies were identified across electronic databases: Medline, PsycINFO, Embase, CINAHL, PubMed and Cochrane library. The search included the following terms: (radiation therapist, radiotherapist, radiographer or technologist) and (psychosocial, supportive, psychol\*, rapport, relationship, communication, psychoeducation, social support, patient education, patient satisfaction or health communication) and (patient) and (anxiety, depression, stress, distress or coping).

Hand-searched journals included Journal of Medical Radiation Sciences, The Radiographer, Radiation Therapist and Journal of Radiotherapy in Practice. Reference lists of identified studies were also searched.

Note: The search was re-run in August 2018 to identify relevant articles published between 2015 and 2018.

### *2.2.1. Screening*

Initial search results were checked for duplicates. Titles and abstracts were independently screened by authors (K.E., H.D.) and studies were excluded according to pre-determined PICO criteria (Table 2.1). Discrepancies were resolved by discussion, and the remaining studies were subjected to blinded examination of methodology to assess eligibility.

**Table 2.1. PICO definitions of inclusion criteria**

PICO	Inclusion criteria
Population	Radiation therapists or radiation therapy patients receiving external beam treatment
Intervention	Radiation therapist led
Comparison	With or without control group
Outcomes	Patient-related: anxiety, depression, distress, quality of life, self-reported side effects and symptoms, satisfaction, adherence to treatment, unplanned admissions; Radiation therapist-related: perceptions, confidence, communication or feasibility of intervention.
Study type	Any

### 2.2.2. Data extraction and analysis

Author, K.E., extracted the following data: type and aim, participants, timing and measurement, intensity and feasibility. This information was reviewed and assessed against pre-determined quality criteria without knowledge of study results (Tables 2.2, 2.3) (42).

No article was excluded on quality alone and all authors reached consensus on quality ratings via discussion. Full text copies of potentially relevant articles were obtained, and results and reported outcomes were extracted for review.

A meta-analysis of relevant articles was not feasible, due to the diversity of interventions, measures and outcomes. Therefore, a qualitative synthesis was conducted.

### **2.3. Search results**

The search identified 263 articles, of which 251 were excluded, based on non-English language, duplicate or relevance during title, abstract and methods review. In total, 12 articles, involving 1363 patients, were included. Most were conducted at single centres and included patients 18 years or older. The most common reasons for patient exclusion were too unwell, identified cognitive deficits or unable to communicate fluently in the nominated language.

The 12 relevant studies were classified into three categories according to approach or intervention type: 'Patient Information and Education' 5 studies, 'Patient Perspectives' 3 studies or 'Screening and Needs Assessment' 4 studies (Figure 2.1). Publications exploring the same sample population and data were reported together, this included articles by Clover et al. and Oultram et al (30, 39) and combining Egestad (10, 43). Quality assessment and results are discussed below.

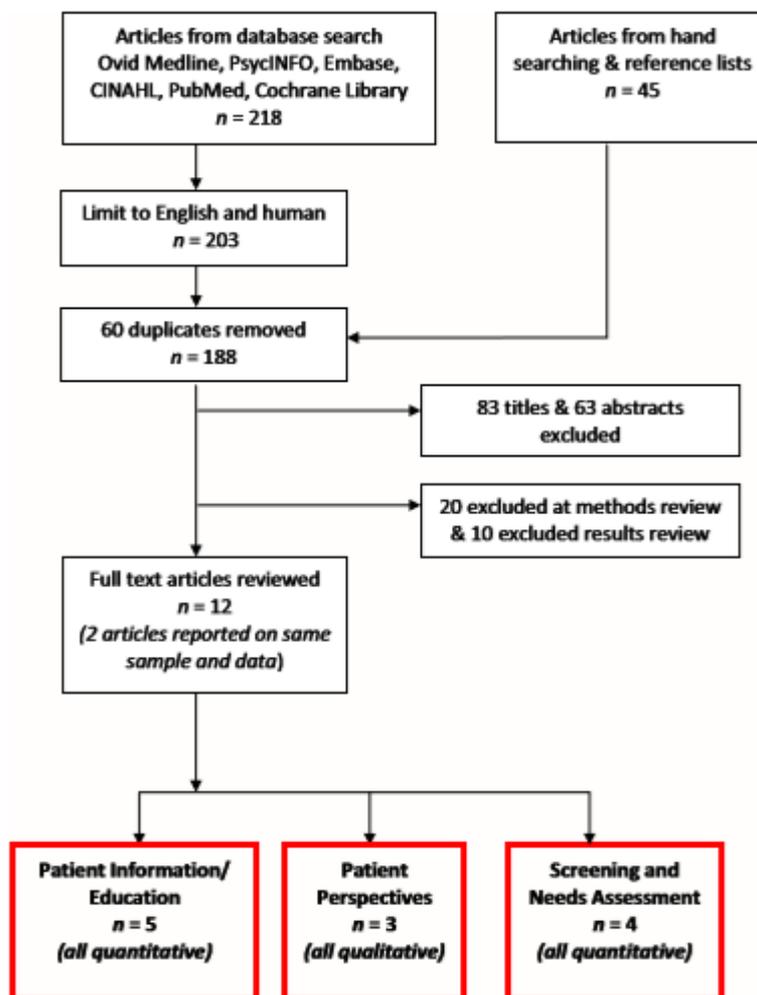


Figure 2.1. PRISMA flow diagram of search results

Note updated search: The search was re-run in August 2018, identifying six relevant publications. Halkett et al reported RT Prepare trial results of two publications captured in the original search (13). Savage et al published research related to patient preferences for receiving information and reported the effect of RT-led education sessions on patient anxiety (44). Jimenez et al compared patient education using the virtual environment for radiation therapy training (VERT) delivered in the university setting versus standard patient education delivered in the clinical setting (45). These publications are included in further discussions below. Research by Hulley, Butlin et al and Jimenez et al were excluded from the systematic review due to a lack of anxiety outcome measures (46-48).

### 2.3.2. *Quality assessment*

Analysis was guided by preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines and checklist, to assess benefits and harms of a healthcare intervention (42). Subsequently, publications were assigned a quality rating of 'high', 'moderate' or 'low' for each criterion, followed by an overall ranking. Any article with varied rankings across criteria was assigned the lower ranked quality rating. In total, one study was ranked high quality, seven moderate, and four low (Tables 2.2, 2.3). Methodological weaknesses were identified in relation to workflow, sample size and responder bias.

Workflow and sequencing of interventions and measurements may have impacted results of three studies. In these studies, patient self-report measures were completed after the intervention, and after the patients' first treatment session, consequently, it is impossible to determine the effect of the intervention alone (49-51).

Sample sizes were small, with four of eight quantitative studies recruiting 56 patients or less (49-52). Such samples are insufficiently powered to detect small but meaningful effect sizes. Furthermore, only two studies incorporated control groups to enable assessment of the intervention effect (53, 54).

Responder bias may have inflated the effect of group education sessions on anxiety, as session attendance was voluntary, and studies did not collect data from non-attendees (50, 52). Canil et al. reported a skewed population including more: non-immigrant participants, with higher socio-economic status and English as a primary language (50).

A summary of included studies is shown in Table 2.4.

**Table 2.2. Outline of quality rating criteria**

Type	Number	Criteria
Outline of quality rating criteria		
Quant	1	Intervention details: type, aim, timing, measurement, intensity, feasibility
Quant	2	Risk of bias assessed Concealed – Blind or double blind Method of allocation including sequence generation and concealment from recruiters
Quant	3	Control group in study design
Quant	4	Measurement tools validated Validity, reliability addressed Generalisability
Qual	5	Research credible? (data fitting to views of participants) Research dependable/reliable? (logical, traceable, clearly documented) Research confirmable/objective? (analysis grounded in data, researchers bias stated and explored)

**Table 2.3. Included studies rated according to quality criteria**

First Author and Year	Study Type	Criteria Number					Overall Quality Rating
		1	2	3	4	5	
Halkett 2013 <sup>47</sup>	Quant	H	H	H	H	-	H
Dong 2014 <sup>43</sup>	Quant	H	-	-	M	-	M
Braeken 2011 <sup>48</sup>	Quant	H	M	H	M	-	M
Clover 2011 <sup>35</sup>	Quant	H	-	-	M	-	M
Oultram 2012 <sup>26</sup>	Quant	H	-	-	M	-	M
Halkett 2012	Quant	M	-	-	M	-	M
Mitchell 2012 <sup>49</sup>	Quant	M	-	-	M	-	M
Canil 2012 <sup>44</sup>	Quant	L	-	-	L	-	L
Miller 2008 <sup>46</sup>	Quant	L	-	-	L	-	L
Halkett 2007 <sup>34</sup>	Qual	-	-	-	-	M	M
Egestad 2013 <sup>9</sup>	Qual	-	-	-	-	L	L
Egestad 2013 <sup>3</sup>	Qual	-	-	-	-	L	L

**Table 2.4. Summary of included studies**

Author Year	Type	Target cancer diagnosis	Cate gory	No. of Pat-ients	No. of RTs	RT Training	Results
Halkett <sup>47</sup> 2013	RCT	Breast	PIE	122	10	2 mandatory workshops: 1) Preparing patients for radiation therapy 2) Eliciting and responding to emotional cues	<ul style="list-style-type: none"> <li>At pre-planning time point, significant results for intervention vs. control: anxiety reduced by 0.15 points, knowledge (planning) increased by 3.5 points, knowledge (treatment) increased by 5.3 points, radiation therapy related concerns reduced by 0.9 points.</li> </ul>
Dong <sup>43</sup> 2014	Cross-Sectional	Mixed	PIE	56	10	N/A	<ul style="list-style-type: none"> <li>RTs scored high on “MPCC Information” (explaining radiation therapy procedures, skin care, side-effects)</li> <li>RTs scored low on “MPCC Feelings” (inquiring about patient feelings/fears/anxieties, understanding of radiation therapy)</li> <li>Post-consultation decrease in STAI scores (range): baseline 10.98 (6 – 24), post-consultation 9.6 (6 - 17)</li> </ul>
Braeken <sup>48</sup> 2011	RCT	Mixed	SNA	568	7	1hour session - use and interpretation of SIPP conducted by the researcher and 2 social workers	<ul style="list-style-type: none"> <li>SIPP feasible and valued by most patients and some RTs</li> <li>Patient perspectives: 67.5% agreed discussing SIPP with RTs was important; 47.4% rated discussions as pleasant; usefulness of discussing physical, psychosocial and sexual issues with RTs were 56, 39.3 and 9.3%, respectively.</li> <li>RT 7 vs.13month FU re SIPP usefulness for ‘quality of consult’ – 33.3, 16.7 and 50.1%, vs. 66.7, 0, 33.3% negative, moderate and positive, respectively</li> <li>RTs were negative toward: changing communication styles, SIPP usefulness in referring patients to psychosocial care, feasibility of discussing psychosocial issues</li> <li>RTs reported increased patient communication and knowledge of patient issues through screening processes</li> <li>RT motivation positively correlated with ‘usefulness’ of screening processes</li> </ul>

Clover <sup>35</sup> 2011 & Oultram <sup>26</sup> 2012	Cohort	Head & neck or Brain	SNA	105	35	N/A	<ul style="list-style-type: none"> <li>• At CT-Sim: RTs identified 27% of patient self-reported cases of anxiety, and 90% of non-anxious cases, provided verbal reassurance alone to 3 patients, and 3 patients had their mask removed</li> <li>• At Fraction 1: RTs identified 50% of patient self-reported cases of anxiety, and 57% of non-anxious cases; provided verbal reassurance alone to 3 patients, 3 patients had their mask removed (1 refused further treatment), 1 patient received verbal reassurance and mask removal (2 of these patients were unable to complete treatment that day).</li> <li>• Authors concluded that patients may have under-rated anxiety, whilst RTs may have over-rated anxiety</li> </ul>
Halkett <sup>45</sup> 2012	Pre-post feasibility	Breast	PIE	13	4	2 mandatory workshops: 1) Preparing patients for radiotherapy 2) Eliciting and Responding to Emotional Cues	<ul style="list-style-type: none"> <li>• HADS scores decreased from baseline to T1 and T2: Baseline mean = 13.6 (SD= 8.03, range = 2-22); T1 mean = 6.4 (SD = 4.9, range = 2-19); T2 mean = 7.0 (SD = 7.5, range = 0-20)</li> <li>• Mean scores for 'Concerns about radiotherapy' dropped from baseline T1, mean=4.4 (SD=2.45), to T2 (post planning intervention) mean=2.50 (SD=1.64), respectively</li> <li>• 'Knowledge of radiotherapy' scores increased from T1 to T2 and T3</li> <li>• Patients reported the intervention was beneficial in preparing for treatment</li> <li>• RTs were positive about delivering intervention and the perceived benefit to patients</li> <li>• The intervention was feasible and acceptable</li> <li>• Time, staffing and space were identified as barriers in delivering intervention. Time and staffing issues were remedied.</li> </ul>

Mitchell <sup>49</sup> 2012	Cohort	Mixed	SNA	379	30	Optional 1-hour session in use of screening tool. Communications training also available. Less than 25% of clinicians attended	<ul style="list-style-type: none"> <li>• RTs report screening 'useful', 'not useful' or 'unsure' in 43, 21.5 and 35.4% of assessments, respectively</li> <li>• Significant positive correlation between RTs rating screening as 'useful' and rating any of the following: the 'screening tool as practical', the 'RT having low confidence' or 'assessing a patient with high anxiety'</li> <li>• Favourable perception of screening was significantly correlated with both completion of screening tool training and improved detection of psychological issues</li> <li>• RTs reported increased patient communication and knowledge of patient psychological issues using screening</li> </ul>
Canil <sup>44</sup> 2012	Cross-sectional	Mixed	PIE	24	N/A	N/A	<ul style="list-style-type: none"> <li>• Anxiety STAI-S pre and post-test median scores were 2.00 and 1.46, respectively (p&lt;0.001). No change= 1 patient, increased anxiety= 3 patients</li> <li>• Self-efficacy CBI-B pre and post-test median scores were 6.96 and 7.82, respectively (p&lt;0.001). No change= 3 patients</li> <li>• 16 of 23 attendees reported reduced concerns</li> <li>• Many reported reduced feelings of isolation</li> </ul>
Miller <sup>46</sup> 2008	Cross-sectional	Mixed	PIE	50	N/A	N/A	<ul style="list-style-type: none"> <li>• Post intervention, patients reported: feeling more confident and less anxious about treatment; meeting other patients helped decrease feelings of isolation; reassurance was gained through staff openness and friendliness</li> <li>• Components rated most valuable were demonstration of the treatment machine 66% and informal one-on-one chat 34% with RT staff</li> </ul>

Halkett <sup>34</sup> 2007	Qualitative interview	Breast	PP	34	N/A	N/A	<ul style="list-style-type: none"> <li>• Patients perceive RTs as technical professionals, but also information and supportive care givers</li> <li>• Main theme: the importance of the patient achieving emotional comfort</li> <li>• Emotional comfort is achieved by forming relationships with RTs and gaining information.</li> <li>• Achieving emotional comfort can decrease anxiety and enables the patient to feel more relaxed, a sense of belonging and confident in the treatment and RTs skills</li> <li>• Developing a relationship with the same RTs daily was perceived to reduce anxiety, improve continuity of information and treatment accuracy</li> </ul>
Egestad <sup>9</sup> 2013 & Egestad <sup>39</sup> 2013	Qualitative interview	Head & Neck	PP	12	N/A	N/A	<ul style="list-style-type: none"> <li>• Main themes: emotional vulnerability, need be treated as a unique person</li> <li>• Subthemes: to be understood, emotional support, to feel safe, to form relationships, politeness and communication</li> <li>• Patients valued effective communication, being treated as an individual, care/empathy and acknowledgement</li> <li>• RTs who initiated relationships, spent time with patients and provided information helped decrease patient vulnerability, anxiety and loneliness</li> <li>• Familiar RTs who provide information and build a relationship with the patient can reduce patients' loneliness, existential anxiety and uncertainty</li> <li>• Perceived RT incompetence can increase patient insecurities and anxiety</li> </ul>

ASR= Authentic Self Representation, CT-Sim= Computed Tomography Simulation, FU= Follow-up, HADS= Hospital Anxiety and Depression Scale, MPCC= Measure of Patient Centre Communication, N/A= Not Applicable, NK= Not Known, PIE= Patient Information/Education, PP= Patient Perspectives, SIPP= Screening Inventory of Psychosocial Problems, SNA= Screening and Needs Assessment, STAI= State Trait Anxiety Inventory.

### 2.3.3. *Patient information and education*

All studies in this category reported decreased patient anxiety. Two studies reported results of group patient information and education sessions (50, 52) while three studies investigated one-to-one RT-led education/information sessions (49, 51, 53).

Canil et al. assessed the impact of group sessions (n = 24) and detected a significant decrease in anxiety ( $p < 0.001$ ) from baseline to post-intervention (50). In a cross-sectional study completed after a group session, Miller reported that 47 (94%) patients felt more confident and less anxious (52). Dong et al. assessed patient-centredness of one-to-one pre-treatment sessions (n = 56) and reported a post-consultation decrease in anxiety of 1.2 points (49). Halkett et al. also demonstrated one-to-one psycho-educational interventions reduced anxiety (n = 13) from baseline (post-radiation oncologist consultation) to radiation therapy planning and first treatment (51). In a pilot randomised control trial (RCT) RT Prepare (n = 122), Halkett et al. showed a greater reduction in anxiety between baseline and post-radiation planning in the intervention group compared to usual care (53). Halkett et al, recently published results of RT Prepare which confirmed pilot findings (13). The intervention group, 218 patients, attended two tailored one-on-one information and education sessions led by RTs to address pre-treatment anxiety. These patients reported significantly lower distress at treatment commencement, as well as significantly lower concerns, higher knowledge, and higher preparedness for procedural and sensory-psychological concerns relating to radiation therapy, than the usual care group of 190 patients (13).

Two publications relating to patient education were added to this review following the 2018 'top up' search. Savage et al, surveyed 45 patients (with breast or prostate cancer) regarding preferences for receiving information about radiation treatment. RTs conducted group or individual information sessions with patients. Survey results showed 51% agreed information sessions reduced their anxiety. Patients also indicated they preferred one-on-one sessions as it provided an opportunity to ask questions and clarify information, improving readiness for treatment (44). Jimenez et al compared the impact of RT-facilitated patient education using a virtual reality education tool, known as VERT, (n=18) compared to

standard RT-led patient education delivered using verbal and written information (n=19) in patients diagnosed with breast cancer. Both groups showed a gradual but significant decrease in anxiety at each measured time point - after initial radiation oncology consult, pre-simulation, beginning and end of treatment – and RT related knowledge was significantly increased in the VERT group at all time points (45).

Both group and individual education/information sessions are effective in reducing patient anxiety, reducing fear of the unknown and feelings of loneliness. An increase in self-efficacy, knowledge of radiation therapy and preparedness for treatment were reported (50-53). However, no direct comparison of individual versus group approach was found in the literature.

#### 2.3.4. *Patient perspectives*

Halkett et al. and Egestad reported congruent themes suggesting RT actions and behaviours can reduce patient anxiety (10, 38, 43). Egestad reported reduced anxiety associated with effective communication, being treated as an individual, active care, empathy and acknowledgement. Patient anxiety was further reduced by RTs who initiated relationships, spent time with patients and provided information (10, 43). Similarly, Halkett et al. reported that patients gained emotional comfort, sense of belonging and increased confidence in RTs by forming relationships and receiving information (38). Both authors reported that seeing the same RTs daily reduced anxiety and influenced perceptions of continuity of information and care, accurate treatment delivery, safety and RT competence (10, 38, 43).

Patients perceived RTs to be competent if they performed their technical duties quickly and confidently, were able to answer questions, recognised and managed side-effects and explained unexpected events (e.g. machine breakdowns). Egestad highlighted that adverse side-effects can occur, or be poorly managed, due to lack of information sharing and lack of relationship building (43).

These studies indicate RT–patient relationships, communication and continuity of care are important aspects of healthcare that reduce patient anxiety.

### 2.3.5. *Screening and needs assessments*

Results in this category varied. Braeken et al. concluded that use of the Screening Inventory of Psychosocial Problems (SIPP) screening tool was feasible, with most patients and RTs agreeing that screening discussions were important and pleasant. 'Physical' and 'emotional' needs were rated as acceptable to explore with screening, but 'sexual' issues were not. In the context of individual patient screening processes, RTs rated the SIPP highly as an 'invitation to discuss' and provide 'better insight into patients' psychosocial well-being'. However, global assessment of the usefulness of the SIPP varied across information items and time points. At 7 months post-study commencement, RTs highly rated SIPP as useful to 'contribute to discussion', 'quality of consult' and 'contribution to psychosocial discussions', but these were rated poorly at 13 months (54). Mitchell and Symonds reported that 43% of RTs rated screening with the 'distress and emotion thermometers' as useful. The screening process was found to be most useful when RTs were uncertain of the presence of anxiety or when anxiety was clearly high. Mitchell and Symonds also noted that RT motivation, use of screening and detection of psychosocial issues all increased if RTs rated the screening tool as practical and relevant (55). Clover et al. and Oultram et al. found slight agreement between anxiety reported by patients compared with RTs. Of those patients self-reporting anxiety, RTs correctly identified 27% of cases of anxiety at radiation planning and 50% at first treatment (30, 39).

These studies indicate that RT-led 'screening and needs assessment' is feasible, improves communication with patients and increases RT knowledge of patient issues (30, 54, 55).

### 2.3.6. *Psychosocial referrals*

Braeken et al. monitored psychosocial referrals made at one-to-one sessions between the patient and their assigned RT utilising the SIPP. During these sessions, conducted prior to commencing treatment, 33 referrals were recorded. Of patients referred, 31 demonstrated sub-clinical or clinical psychosocial symptoms. Twenty-one referrals were accepted, indicating an appropriate time point to offer psychosocial referrals. During sessions

conducted at completion of the treatment course, nine patients, all of whom experienced clinical psychosocial symptoms, were offered and accepted psychosocial referrals (54).

#### *2.3.7. Time to deliver screening processes and interventions*

Time may be a barrier to implementing new processes. Mitchell and Symonds and Braeken et al. reported average RT–patient screening discussion times of 3 and 5.3 minutes respectively (54, 55). Dong et al. recorded a wide range of times, 3.36–16.17 minutes, in pre-treatment education sessions during which some anxiety is addressed, suggesting variability between sessions (49). Halkett et al. monitored the quality of pre-planning and pre-treatment education consultations, hence these longer session times (mean = 24.9 minutes) may be more representative of time required to deliver a meaningful intervention (53).

#### *2.3.8. Radiation therapist training*

Four of 10 studies provided training to RTs prior to study commencement. Mitchell and Symonds, and Braeken et al. provided 1-hour training sessions specific to the use of screening tools being tested and recognition of emotional issues (54, 55). Halkett et al. provided mandatory training consisting of two 4-hour workshops for RTs delivering the intervention (51, 53). Mitchell and Symonds reported that less than 25% of participants completed training and speculated that lack of protected time to attend training was a contributing factor (55). Both Mitchell and Symonds and Braeken et al. concluded that their results may have been negatively impacted by insufficient training and recommended further CST (54, 55).

Halkett et al.'s RT training workshops focused on content and delivery of radiation therapy specific information to patients and CST, specifically 'eliciting and responding to emotional cues'. Real-time feedback, ongoing mentoring and support were provided to RTs during study intervention delivery (51, 53).

Oultram et al. and Dong et al. also recommended CST to improve detection and management of patient issues including anxiety, claustrophobia, coping and side-effects (30,

49). Clover et al. and Oultram et al. reported that RTs over-estimated anxiety compared to patient self-report, and suggested training may improve accurate detection (30, 39).

#### 2.3.9. *Implementation recommendations*

'Information/education' and 'screening and needs assessment' interventions are feasible and improve patient outcomes (49-54). However, they must be implemented strategically due to perceived negative impact on staffing requirements, appointment schedules and resources, e.g. private rooms (40, 55). Mitchell and Symonds recommended engaging motivated and non-motivated RTs in the development process, providing training, ongoing support/mentoring and meaningful feedback and developing clear action plans (55). Implications are that management and frontline RTs work together to provide infrastructure to enable interventions and overcome identified barriers to achieve improved patient care and outcomes, specifically reduced anxiety.

## 2.4. Discussion

This systematic review identified a small number of publications focused on RT-led psychosocial practices including detection, assessment or management of patient anxiety. All recognised the need to address psychosocial issues and indicate RTs can positively impact on patient experiences of radiation therapy. Specifically, RT-patient interactions can reduce patient anxiety through effective communication, forming relationships, acknowledging patients as individuals and provision of education/information. Patient anxiety could be further reduced by exploring the RT role, application of screening and needs assessments and training in both communication skills and detection and management of emotional distress.

The increasing prevalence and burden of emotional morbidity related to cancer diagnoses and survival are widely recognised. This has resulted in the development of 'Clinical Practice Guidelines for the Psychosocial Care of Adults with Cancer', which provide awareness and practical information to HCPs to improve the management of psychosocial issues for patients and carers (2). Turner et al. highlighted most HCPs have minimal training and knowledge in

this area (28). In fact, it is reported that RTs are not confident discussing psychosocial issues (34). However, all HCPs working with cancer patients need to adhere to these guidelines in clinical practice to enable early detection of psychosocial issues, empathetic management and effective referrals to specialised care (28).

Radiation therapy provokes high anxiety, with patients reporting fear of radiation and that being in an oncology department reminds them of their life-threatening condition (10, 43, 52). RTs prepare patients for the procedure through education and information before treatment. Adequate preparation has been shown to reduce patient anxiety as well as reduce recovery time and complication rates in aversive and invasive medical procedures (56). Furthermore, RTs interact with patients daily, and throughout treatment are able to tailor information to suit individual patient's changing needs and to involve patient's in their own care, for example, by encouraging them to ask questions (28, 57). The RT–patient rapport also enables RTs to consider whether to involve families and carers in education/information sessions which may improve the overall patient experience and potentially reduce patient and family anxiety (40). In summation, the RT–patient relationship is unique and valued by RTs and patients.

Confusion regarding the RT role may contribute to a lack of patient satisfaction, information provision and psychosocial support. The role is defined by RTs and patients as encompassing technical, information and supportive care components (41). While the RT role will vary across departments, clear definitions and expectations could focus RT interactions and increase patient satisfaction, while ensuring patient needs are met.

Braeken et al. reported that RTs were less positive about asking questions regarding patient psychosocial well-being and patients reported that psychosocial and sexual issues were not discussed (54). Similarly, Dong et al. reported that in one-to-one education sessions RTs scored poorly when exploring patients' feelings, fears and anxiety and understanding of radiation therapy. Interestingly, Dong et al. showed a significant positive correlation between patient-centred communication and authentic self-representation; thus, when more interest was shown, the patients represented themselves more honestly, expressed concerns and

asked questions (49). This is important in the context presented by Egestad, where four of five patients, immobilised with a head and neck mask for treatment, experienced claustrophobia but 'forced themselves' through radiation sessions without disclosing their fears (10, 43). It is possible RTs do not ask about patient psychosocial issues as they do not believe it is their role, know how to elicit information or manage concerns. In the UK study, 23 HCPs (oncologists, surgeons, clinical nurse specialists and ward sisters) were interviewed about roles and responsibilities for the detection and management of emotional distress. Many professionals expressed screening and exploring psychosocial issues was not beneficial if the HCP is unable to manage the issues disclosed due to lack of time, training, referral pathways and limited access to specialised services (32).

RT training in the areas of communication skills and emotional well-being could enhance the patient experience (9, 30, 38, 49, 54, 55, 58). Psychosocial care guidelines state HCPs need an understanding of common conditions, such as anxiety and depression, and awareness of effective treatments to enable detection and discussion of such issues with patients (28). This is supported by Mitchell and Symonds who reported RTs and chemotherapy nurses trained in use of screening tools were more satisfied with screening processes and more motivated to screen patients, discuss issues and educate patients (55). Braeken et al., reported low training compliance, stated RTs did not rate psychosocial discussions as important, and RTs did not change communication styles when using the SIPP tool designed to explore psychosocial issues (54). Fallowfield et al. supported these observations following a study of 160 UK oncologists. Fallowfield et al. concluded professional experience alone does not resolve poor practitioner–patient communication, but CST can improve skills, with those who completed CST showing significantly greater expressions of empathy, use of focused questions and appropriate responses to patient cues in consultations after training. Oncologists reported training to be interesting and highly relevant to clinical practice (19). Similarly, Halkett et al. reported 60 RTs who participated in two CST workshops rated strong satisfaction with all aspects of training including relevance to daily practice, increased confidence and acquisition of new skills. However, to ensure effective learning, small group

sessions with opportunities to practice skills and receive feedback are essential (40).

Furthermore, to ensure translation of learned skills into the clinical environment, clinical supervision/mentoring and feedback are recommended (29, 32). Training in emotional distress and CST, including ongoing support for RTs, could lead to improved patient-centred care, recognition and management of patient issues and use of screening processes.

The value of the RT–patient relationship may be enhanced by using screening and assessment tools. Evidence suggests screening tools are more successful in detecting psychosocial issues than relying on clinical judgement alone (32). Screening tools may facilitate triaging by RTs which could reduce burden on limited psycho-oncology resources and provide timely patient support (32, 39). Clover et al. proposed a two-tiered screening and intervention system, with RTs screening for anxiety and managing patients exhibiting low anxiety through skilled communication. Patients with moderate to high anxiety or psychological issues would be referred for specialised care (39). Turner has actioned this innovation in ‘PROMPT’, an RCT with a three-tiered system (24, 29, 59). Additionally, referral pathways must be clear and accessible to RTs, as various patient-reported needs, including physical, sexual, financial and spiritual, may be better provided by multidisciplinary team members such as the RO, RON, social worker, counsellor, nutritionist or other (9).

This systematic review has some limitations. A systematic process was followed to identify relevant publications; however, it is possible that articles may have been missed or were published after the search was conducted. To mitigate this, the search was re-run in August 2018 as previously discussed. Researcher bias is also a conceivable limitation, although this was minimised by involvement of and discussions among all authors.

## **2.5. Conclusions and future directions**

Evidence suggests RTs have a role in psychosocial support through increased communication and information sharing that can benefit both patients and RTs. RT-led practices such as education and information sessions, screening and needs assessments

and relationship building are feasible and promising as moderators of anxiety and warrant further investigation using more rigorous evaluation methods.

Future research in radiation therapy service provision and reducing patient anxiety should focus on RT role definition, RT training in communication skills and detection and management of anxiety, referral pathways to psychosocial services and implementation of these processes into clinical practice. In addition to these areas, future research should consider professional capability frameworks defined by regulatory bodies.

## **2.6. Summary**

This systematic review identified the RT role in psychosocial care is not clear and there are concerns about RTs knowledge and skills to detect and manage anxiety. As a result, this research aimed to explore RT knowledge and skills, and the application of these in the radiation oncology setting.

## **CHAPTER 3. METHODS**

### **3.1. Research design**

A cross-sectional, mixed method survey design was employed to research RT ability to detect and manage patient anxiety. The survey explored RT values, skills, training and knowledge regarding patient anxiety and psychosocial support.

#### *3.1.1. Ethics*

The HREC (University of Sydney) approved this research, project number 2016/227 (Appendices 3-5). The participant information statement (PIS) was provided online and survey submission implied consent. All participants provided consent.

### **3.2. Survey development**

The research team developed the 'RTs and psychosocial support' survey instrument. The survey incorporated original items and patient vignettes, and embedded existing items from RT research, and the Professional Quality of Life Scale (ProQOL5) (60, 61). (Appendix 2 shows the survey development and pilot publication).

#### *3.2.1. Pilot process*

The survey instrument was piloted to assess content validity, functionality and length using a three-step process (62-64). To complete this, three groups were formed to offer perspectives on the relationship of items to the conceptual domain and recommend refinements (65).

The first group were RTs who completed the pilot survey and feedback form. The second comprised professional association representatives and academics who provided written feedback regarding survey content validity and relevance to international RTs. The third was the research team, a panel of experts formed to finalise survey content based on feedback from groups 1 and 2.

Four radiation oncology departments volunteered to participate in the pilot, following a presentation (by K.E.) at the NSW Radiation Therapy Research Showcase (66).

Departments included a mix of urban, outer metropolitan, public and private organisations. A representative from each department invited four RTs (pilot responders) via email to the complete the online survey and pilot feedback form (n=16). The email invitation, PIS, survey link and feedback form were forwarded to pilot responders by the representative. The feedback form consisted of 12 open-ended questions to encourage qualitative feedback regarding survey content validity, clarity, internal consistency, appropriateness, intent, length and flow (65) (Table 3.1) (Appendices 2, 6 and 7 show the full survey development publication, participation invitation and feedback form, and pilot survey).

**Table 3.1. Pilot survey – Feedback questions and number of responses**

No.	Question	No. of responses (n=16)			
		Yes	No	DNA	n/a
1	How long did the survey take to complete? (median, range)	35 min (20–50 min)			
2	Is this acceptable?	6	7	–	–
3	Were any of the questions unclear?	2	11	–	–
4	Were any of the response options unclear?	2	11	–	–
5	Were any of the response options not appropriate or relevant?	2	11	–	–
6	Did any of the questions make you feel uncomfortable?	2	11	–	–
7	Did you answer the questions that made you feel uncomfortable?	3	3	4	3
8	Were all sections of the survey clearly explained?	11	0	2	–
9	Are there any questions you would like to see taken out of the survey?	2	9	2	–
10	Are there any questions you would like to add to the survey?	1	11	1	–
11	Do you have any further comments or feedback?	6	5	2	–
12	Are you willing to be contacted via phone to further discuss?	5	4	4	–

DNA, did not answer; n/a, not applicable; one participant did not complete questions 8–12.

### 3.2.2. Pilot survey results

Thirteen of sixteen RTs (81%) completed the pilot survey (online) and feedback form (returned via email). The response rate demonstrated a willingness to participate, and demographics showed a range of personal and workplace characteristics (Table 3.2).

**Table 3.2. Pilot survey - Respondent demographics**

Characteristic	Number (%)
Age (mean, range)	39 (25–54)
Number of years as a qualified RT (mean, range)	16 (1–31)
Sex	
Male	4 (31)
Female	9 (69)
Employment status	
Fulltime	9 (69)
Part time	4 (31)
Current role	
Clinical RT	11 (85)
Research RT	2 (15)
Type of organisation	
Public	7 (54)
Private	6 (46)
No. of RT staff in department (mean, range)	30 (10–50)
No. of linear accelerators in department (mean, range)	3 (2–5)

RT, radiation therapist.

Responses to feedback questions were compiled into four thematic groups: (i) time/survey length; (ii) content; (iii) functionality; and, (iv) other. Responses were discussed by the research team and consensus reached regarding survey amendments (Table 3.3).

**Table 3.3. Pilot survey – Summary of respondent feedback**

No.	Feedback comment	Domain (T, C, F, O)	Status (A, N)	Reason not actioned
1	Did 20 min then lost responses...started over... 30 min to complete	T/F	A	n/a
2	30 min is acceptable. Reduce scenarios to 2	T/C	A	n/a
	Slightly too long to do at work... but appropriate for enough information to be gathered	T	A	n/a
	15 min	T	A	n/a
	Yes, if organisation support is given	T	–	n/a
	Shorter would be better... but to get the information required this is okay	T	A	n/a
	I believe an acceptable time is 10–15 min	T	A	n/a
3	'Any of the following aspects of RT affected...' might need 'potentially'	C	N	Existing tool
	... I was unsure of whether 'attendance' meant face to face training or ...online	C	A	n/a
4	Some of them could be more specific	C	N	Not specific
	The 'not sure' options could be 'sometimes' but then there might be... indecisiveness	C	N	Existing tool
	...a neutral option instead or along with the 'I don't know' option.	C	N	Existing tool
5	See above (included in other comments)	C	–	n/a
	The traumatic event ones were strange as I haven't had traumatic event	C	–	n/a
6	DOB	C	A	n/a
9	One scenario less	C	A	n/a
	I feel that all questions were relevant and should not be removed	C	–	n/a
	The case studies were not very useful. I would remove or just have one	C	N	Authors disagreed
10	Suggestions on the most optimal ways of effectively communicating	C	N	Authors disagreed
11	Great layout and very comprehensive	C	–	n/a
	...the second scenario story was on the previous page to the question, I went to go back and it went to the beginning of the survey and lost all my answers	F	A	n/a
	No back button on the survey	F	A	n/a
	... contained appropriate questions and answers however... a bit lengthy	T	A	n/a
	Fantastic	O	–	n/a
	This is an important topic and happy to contribute	O	–	n/a

n/a, not applicable; T, time; F, functionality; C, content; O, other; A, actioned; N, not actioned.

Of 13 respondents, seven reported time to complete the survey was too long (median 35 min, range 20–50 min); 11 reported survey questions and response options were clear, appropriate and relevant; three highlighted the absence of a 'back' button to view previous information; and two provided positive comments regarding the research concept.

Subsequently, some items were removed, including one vignette, and a 'back' button added. These amendments aimed to minimise responder burden, improve functionality and increase the likelihood of a representative sample of RTs completing the survey (Appendix 2).

Pilot results demonstrated the 'RTs and psychosocial support survey' was a useable instrument likely to yield informative results in exploring RTs values, skills, training and knowledge regarding patient anxiety and psychosocial support (67).

### 3.3. Main survey

The survey was developed and run using the Qualtrics online survey platform (April 2016, Qualtrics, Provo, Utah, USA). The final version included the PIS, and nine sections comprising 145 items. Sections 1-9 incorporated items grouped by topic, and section 10 enabled participants to claim continuing professional development (CPD) points and provide contact details for communication of study results (Table 3.4) (Survey included as Appendix 8).

**Table 3.4. Main survey - Sections and items**

Section	Focus	Items
1	Participant information statement (PIS)	n/a
2	Demographics	15
3	Communication skills training (CST)	25
4	Perceived value of radiation therapist interactions with patients	10
5	Signs of anxiety (previously theoretical knowledge of anxiety)	17
6	Detecting and managing anxiety using vignettes	8
7	Current work practices	15
8	Current work resources	17
9	Work related stress	32
10	Additional information – CPD and contact information	6
Total		145

#### 3.3.1 Population

RTs from Australia, NZ and Canada were invited to participate due to similarities in training, workforce, and clinical practice.

#### 3.3.2. Recruitment

Multiple recruitment strategies were used in the period of August to November 2016. RTs were invited to take part via email, social media, and promotion through professional associations and research network websites and newsletters. Snowballing techniques were used, and individuals encouraged to invite their colleagues (68).

### 3.3.3. *Data Collection*

Submitted surveys were deidentified and assessed for eligibility and completeness after the survey closed. Surveys were eligible if completed by qualified RTs from Australia, NZ or Canada. Surveys were defined as complete if the participant had reached the survey end, even if some questions were not answered.

Data was cleaned (by K.E.) using IBM Statistical Package for Social Sciences (SPSS) [version 25.0] (SPSS, Armonk, NY, USA). The following was conducted:

- identified data was extracted to maintain anonymity and a reference number assigned to each respondent;
- responses stating a range of numerical values were averaged;
- items and responses considered incomplete, uninterpretable, or not feasible were treated as missing data;
- response options of *other* not supported by further information, were treated as missing data;
- free text comments indicating endorsement of an included response option were recoded, except where small numbers were not perceived to have any bearing on results, or where changes to the dataset were a risk to accuracy of data analysis.

### 3.3.4. *Survey items and measures*

Items from existing measures were incorporated in the survey unchanged. New items were designed to elicit qualitative and quantitative data and ensure measurable responses whilst minimising participant burden. A range of response options were used in each section and are outlined below (Appendix 8).

#### Section 1 – Participant information statement (PIS)

No measures used – information only.

## Section 2 – Demographics

Items with single, multiple and free text response options capturing personal and department characteristics.

## Section 3 – Communication skills training

Items with multiple response options to capture all forms of training relevant to communication and emotional care. Items with a four-point Likert scale explored RT perceived need and motivation to complete CST. A four-point Likert scale was used consistently throughout the survey to eliminate neutral responses. Items used single and multiple response options, and free text options to explore the perceived effects and barriers of CST related to RTs and the radiation oncology environment.

## Section 4 - Perceived values of RT interactions with patients

An existing ten-item survey tool designed and tested by Hulley was used to investigate values by eliciting a single response - agree, disagree or don't know (46, 60).

## Section 5 - Signs of anxiety

Free text responses were used to extract knowledge of signs of anxiety. A four-point Likert scale was used to ascertain RT confidence dealing with anxious patients. Single response options, multiple response options, and free text were used to explore perceived effects of patient anxiety on radiation therapy and elicit personal experiences of anxiety.

## Section 6 - RT ability to detect and manage anxiety using vignettes

Included two original vignettes followed by three original items. Response options for items 1 and 3 were the same for both vignettes and enabled multiple responses. Item 2 required respondents to provide free text information considered relevant or influential in assessing the patient.

### Section 7 - Current work practices

Incorporated single, multiple and free text response options to ascertain RT knowledge and involvement in routine screening for psychosocial distress in radiation oncology departments. A four-point Likert scale measured how screening results and referrals were communicated.

### Section 8 - Current work resources

Incorporated 16 items designed and tested by Hulley (46, 60). This included one multiple response item; one free text item; five single response items with response options of – agree, disagree, don't know; and ten items with response options - yes, no, don't know.

### Section 9 - Work related stress

Explored RT use of support services using two single response options, followed by the ProQOL5, a freely available 30-item instrument with good construct validity, widely used in healthcare to assess burnout in 'helping professions' (61). A five-point Likert response scale generated three scores: (i) compassion satisfaction; (ii) compassion fatigue burnout; and, (iii) compassion fatigue secondary traumatic stress. Reliability and validity is reported as alpha = 0.88 (n = 1130) and alpha = 0.75 (n = 976), respectively (69).

### Section 10 - Additional information

No measures used.

Note: Results pertaining to sections 7-9 are not included in this thesis but will be reported in future publications.

#### *3.3.5. Vignette Development*

Vignettes were developed to engage respondents in clinically relevant scenarios. These vignettes described fictitious patients, with gender-non-specific names and diagnoses, varying psychosocial needs and expressions of anxiety. The characters were created to elicit a range of responses reflective of RTs' experiences and judgements. Use of

interpretative vignettes may elicit more accurate behavioural intentions from respondents than survey questions designed to attribute cause and effect (70). Previous research using vignettes guided scenario development (60, 71, 72).

Response options were designated relevant, or not, at study design for analysis purposes (Tables 3.5, 3.6). Whilst some response options were the same for both vignettes, results were expected to differ due to patient presentation (Appendix 8).

**Table 3.5. Vignette 1 - Relevant and not relevant response options**

Vignette	Response category	Item 1 Descriptor	Item 2 Indicator	Item 3 Management Strategy
1 Alex	Relevant	<ul style="list-style-type: none"> <li>• Distressed</li> <li>• Worried</li> <li>• Anxious</li> </ul>	<ul style="list-style-type: none"> <li>• Fiddling with car keys</li> <li>• Quiet but attentive, nodding in response to information</li> <li>• Concern about lying still</li> <li>• Feeling nauseous</li> <li>• Not sleeping well</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss referral to psychosocial care with patient</li> <li>• Acknowledge patient's feelings and encourage patient for express concerns</li> <li>• Contact RO/nurse to speak with patient prior to treatment/procedure</li> <li>• Suggest involving patient's friend/family in treatment set-up</li> </ul>
	Not relevant	<ul style="list-style-type: none"> <li>• Happy</li> <li>• Angry</li> <li>• Calm</li> <li>• Sad</li> <li>• Content</li> <li>• Relaxed</li> <li>• I don't know</li> <li>• Depressed</li> </ul>	<ul style="list-style-type: none"> <li>• Age</li> <li>• Diagnosis</li> <li>• Prognosis</li> <li>• Treatment intent</li> <li>• Accompanied by friend to appointment</li> </ul>	<ul style="list-style-type: none"> <li>• Tell patient not to be concerned and get treatment started as quickly as possible</li> </ul>

**Table 3.6. Vignette 2 - Relevant and not relevant response options**

Vignette	Response category	Item 1 Descriptor	Item 2 Indicator	Item 3 Management Strategy
2 Pat	Relevant	<ul style="list-style-type: none"> <li>• Angry</li> <li>• Distressed</li> <li>• Worried</li> <li>• Anxious</li> </ul>	<ul style="list-style-type: none"> <li>• Appears rushed and agitated</li> <li>• Asks many questions, and keeps asking questions</li> <li>• Does not appear to be listening</li> <li>• Has many complaints, does not believe appointment times will fit into daily life</li> <li>• Does not wish to have tattoos</li> <li>• Demands to see doctor before proceeding</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss referral to psychosocial care with patient</li> <li>• Acknowledge patient's feelings and encourage patient for express concerns</li> <li>• Contact RO/nurse to speak with patient prior to treatment/procedure</li> <li>• Suggest involving patient's friend/family in treatment set-up</li> </ul>
	Not relevant	<ul style="list-style-type: none"> <li>• Happy</li> <li>• Angry</li> <li>• Calm</li> <li>• Sad</li> <li>• Content</li> <li>• Relaxed</li> <li>• I don't know</li> <li>• Depressed</li> </ul>	<ul style="list-style-type: none"> <li>• Age</li> <li>• Diagnosis</li> <li>• Prognosis</li> <li>• Treatment intent</li> <li>• Accompanied by friend to appointment</li> </ul>	<ul style="list-style-type: none"> <li>• Tell patient not to be concerned and get treatment started as quickly as possible</li> </ul>

### 3.3.6. Data analysis

Data analysis was conducted using SPSS. It was estimated a sample size of 336-359 completed questionnaires was required to achieve 95% confidence intervals and 5% type I error.

Analysis of demographic characteristics conducted on 'complete' and 'non-complete' surveys showed both groups were similar. However, RTs with any of the following characteristics were more likely to drop-out before survey completion: 1) retired or unemployed; 2) male; 3) direct patient care of more than 30 hours per week. Non-complete surveys were excluded from further analysis.

Analysis of demographic characteristics was conducted. As no differences existed between respondents from Australia and NZ, these countries were combined into a single group referred to as ANZ, which increased statistical power. Two groups are compared throughout this thesis - ANZ and Canada.

Descriptive analysis was conducted for all items. Variables were categorical, and Chi squared test was used, with associations between variables investigated using Spearman's rho correlation analyses. Post hoc analyses explored relationships between characteristics that may impact RT ability to identify and manage anxiety. To account for multiple comparisons a Bonferroni correction was applied to provide a more conservative p-value, with  $p < 0.003$  considered significant (73).

Content analysis was applied to all free text responses. Members of the research team independently derived themes and categorised the same sample of responses for relevant items. Consensus and final categorisation were achieved through group discussion. Data categorisation for the remaining responses was completed by author (K.E.) and reviewed by the team to ensure consistency.

Results of survey sections 2 to 6 are detailed below. Sections 7 to 9 will be reported in future publications.

## CHAPTER 4. RESULTS

### 4.1. Population

The survey yielded 859 responses between 4 August and 1 November 2016. To estimate a response rate, data detailing the number of RTs within target countries in 2016 was sought from Australian Health Practitioner Regulation Agency (AHPRA), New Zealand Medical Radiation Technologists Board (MRTB), and Canadian Institute for Health Information (CIHI). Using available data, the number of RTs in Australia (2442), NZ (350) and Canada (2454) in 2016 was estimated at 5,246 and the response rate estimated as 16.4%.

### 4.2. Demographic characteristics

Of 859 surveys commenced, 582 were eligible and complete (Figure 4.1) (Appendix 9 shows completion by section). These included 240 (41.2%) respondents from Australia, 78 (13.4%) from NZ, and 264 (45.4%) from Canada.

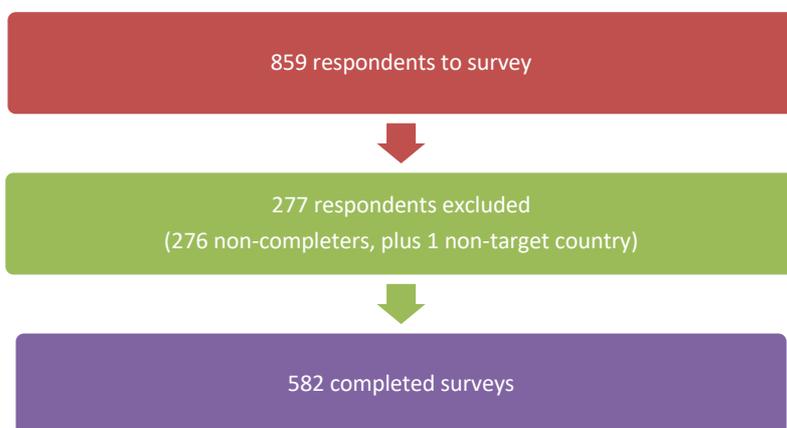


Figure 4.1. **Number of respondents and process of exclusion**

Overall, most respondents were female 509 (87.5%), mean age 37.8 years (range 21-68), mean RT experience 14.7 years (range 0-48), and 354 (60.8%) reported carer responsibilities outside work. Most were full time employed 392 (67.4%), at a public facility 481 (82.6%), and reported more than 30 hours a week of direct patient care 222 (38.1%) (Table 4.1).

**Table 4.1. Demographic characteristics reported by radiation therapists**

Characteristic		Australia n=240 (41.2%)	NZ n=78 (13.4%)	Canada n=264 (45.4%)	Total n=582 (100.0%)
Age	Mean	37.8	36.5	40.1	38.7
	Range	21-68	22-62	23-64	21-68
Years Qualified	Mean	14.9	14.0	14.7	14.7
	Range	0-48	0-44	0-45	0-48
Sex	Male	40 (16.7%)	3 (3.8%)	28 (10.6%)	71 (12.2%)
	Female	200 (83.3%)	75 (96.2%)	234 (88.6%)	509 (87.5%)
	PNA	0	0	2 (0.8%)	2 (0.1%)
Employment status	Full-time	163 (67.9%)	51 (65.4%)	178 (67.4%)	392 (67.4%)
	Part-time	51 (21.3%)	19 (24.4%)	40 (15.2%)	110 (18.9%)
	Other*	26 (10.8%)	8 (10.3%)	46 (17.4%)	80 (13.7%)
Carer responsibilities <sup>^</sup>	Yes	126 (52.5%)	38 (48.7%)	190 (72.0%)	354 (60.8%)
	No	113 (47.1%)	40 (51.3%)	74 (28.0%)	227 (39.0%)
	PNA	1 (0.4%)	0	0	1 (0.0%)
Type of organisation	Public	157 (65.4%)	62 (79.5%)	262 (99.2%)	481 (82.6%)
	Private	76 (31.7%)	15 (19.2%)	1 (0.4%)	92 (15.8%)
	Other <sup>#</sup>	7 (2.9%)	1 (1.3%)	1 (0.4%)	9 (1.5%)
Direct patient care hours per week	None	23 (9.6%)	4 (5.1%)	22 (8.3%)	49 (8.4%)
	1-10 hours	66 (27.5%)	20 (25.6%)	46 (17.4%)	132 (22.7%)
	11-30 hours	79 (32.9%)	17 (21.8%)	83 (31.4%)	179 (30.8%)
	More than 30 hours	72 (30.0%)	37 (47.4%)	113 (42.8%)	222 (38.1%)

PNA = Prefer not to answer; \*'Other' employment status includes casual; not currently employed; retired; and/or other – not specified by the respondent; ^Carer responsibilities relate to RTs who report having dependents/family/friends for whom they provide care to outside working hours. This includes elderly/unwell/disabled family or friends, children, and/or other; #'Other' type of organisation includes not for profit, and/or other– not specified by the respondent.

Respondents worked in radiation oncology departments with a median of 40 RT staff (range 2-200), four linear accelerators (linacs) (range 1-20), and nine hours of linac operation daily (range 4-14). The median number of RTs rostered daily per linac was four (range 2-12), with a median of 30 (range 12-75) patients treated daily per linac (Table 4.2).

**Table 4.2. Departmental demographics reported by radiation therapists**

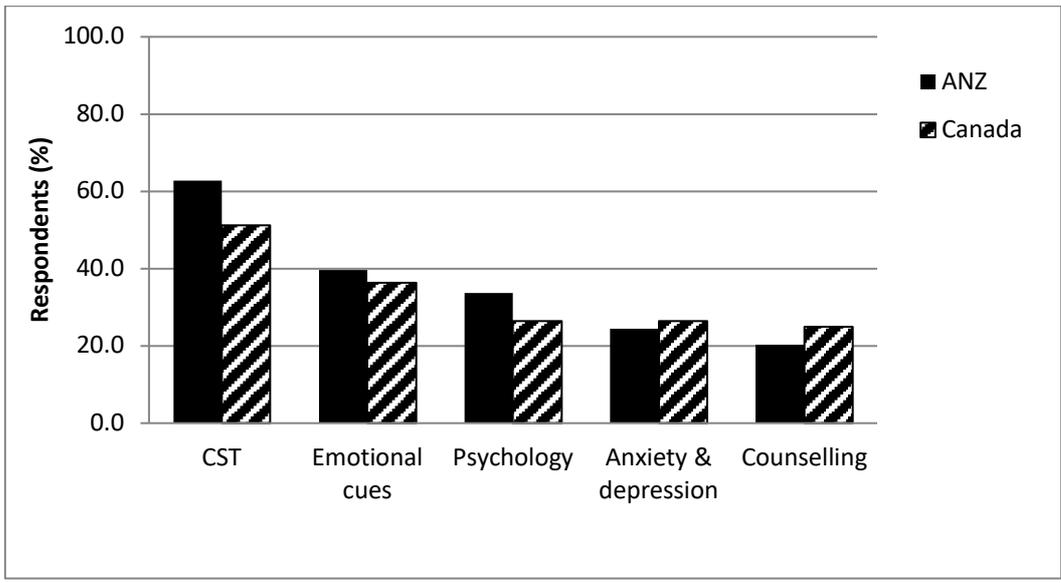
Characteristic		Australia n=240 (41.2%)	NZ n=78 (13.4%)	Canada n=264 (45.4%)	Total n=582 (100%)
RT staff in department	Median	30	40	50	40
	Range	2-130	10-80	7-200	2-200
Linacs in department	Median	3	4	6	4
	Range	1-20	1-6	1-18	1-20
RTs rostered per linac	Median	4	3.5	4	4
	Range	2-9	2.5-4	2-12	2-12
Patients treated per day per linac	Median	32	30	30	30
	Range	12-60	3-75	15-65	3-75
Linac hours of operation	Median	9	8	9	9
	Range	1-14	7-10	4-12	1-14

17 responses were treated as missing as they were unable to be validated.

### 4.3. Training in communication skills (CST) and emotional care

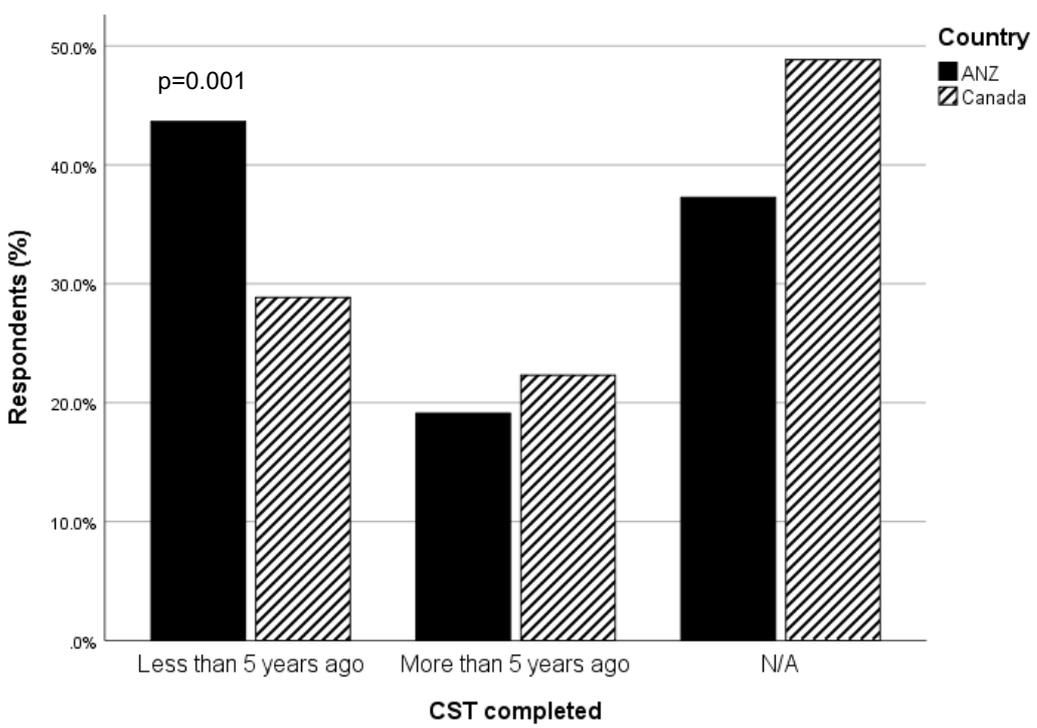
#### 4.3.1. Type of training completed

There were 61 (10.5%) respondents who reported training experiences in all five domains – *communication skills, emotional cues, psychology, counselling, anxiety and depression*. The number of respondents who had not completed training in any domain was 180 (30.1%) (Appendix 10). More respondents had completed CST than other types of training (Figure 4.2). A total of 330 (56.7%) respondents completed CST and the breakdown by country was 197 (62.7%) ANZ and 133 (51.2%) Canadian RTs. Significantly more ANZ respondents reported completion of CST training within the last five years ( $p=0.001$ ) (Figure 4.3) (Appendix 11).



Missing data included 57 (9.8%) respondents - five non-responses and 52 uninterpretable/inconsistent responses i.e. respondents indicated they had not completed training, but provided a timeframe for training completion, and vice versa. 'Other' was selected by 172 respondents, 50 responses were invalid. The remaining respondents indicated 'other' training which included: psychosocial, clinical, palliative/grief, cultural awareness, conflict, and holistic care.

Figure 4.2. **Communication or emotional care training completed by country**



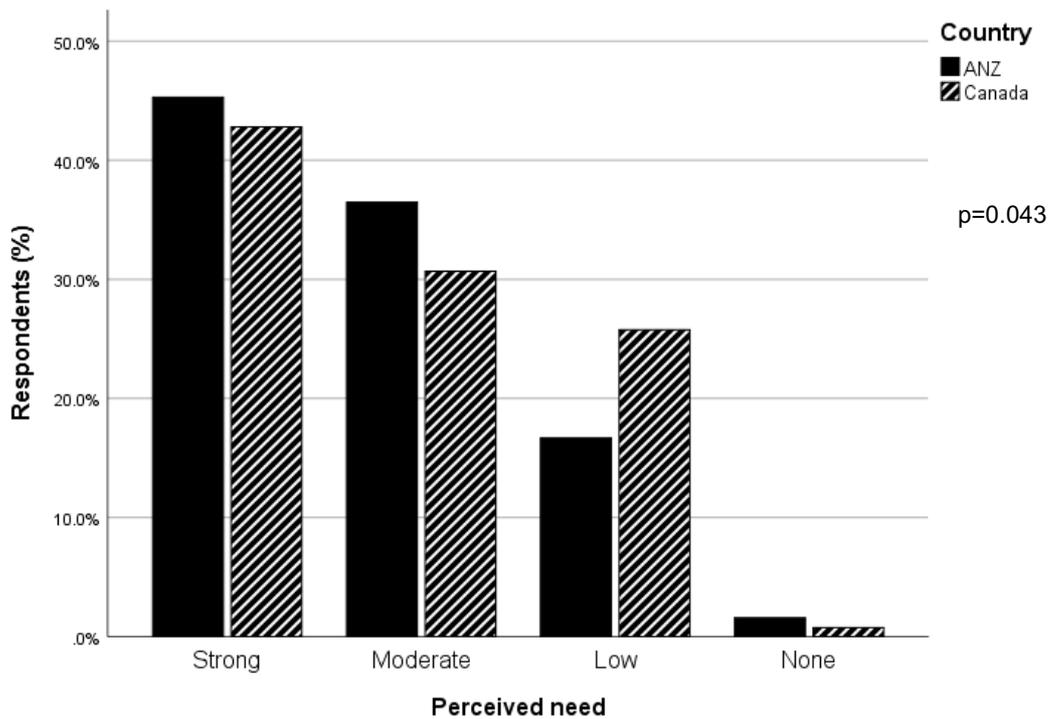
Significant difference of  $p=0.001$  for timeframe of completion of communication skills training (CST) by country.  
 CST - Communication skills training. ANZ – Australia and New Zealand

Figure 4.3. **CST completed by country and timeframe**

#### 4.3.2. Perceived need and motivation to complete CST

Most RTs perceived a moderate-to-strong need to complete CST, 260 (81.8%) ANZ, and 194 (73.5%) Canada, this was not significantly different between groups ( $p=0.043$ ) (Figure 4.4).

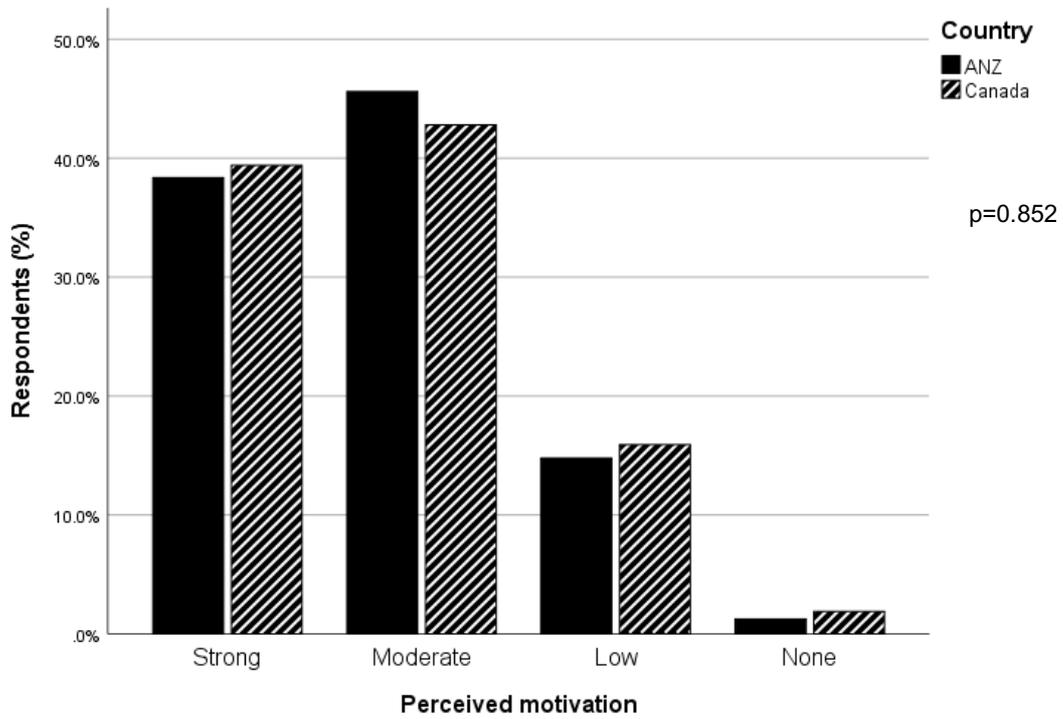
Most RTs rated motivation to complete CST as moderate-to-strong, 267 (84.0%) ANZ and 217 (82.2%) Canada (Figure 4.5) ( $p=0.852$ ). There was a moderate but significant positive correlation between need and motivation ( $r=0.543$ ,  $p=0.000$ ).



CST - Communication skills training. ANZ – Australia and New Zealand.

P-value not significant with Bonferroni correction.

Figure 4.4. **Perceived need to complete CST by country**

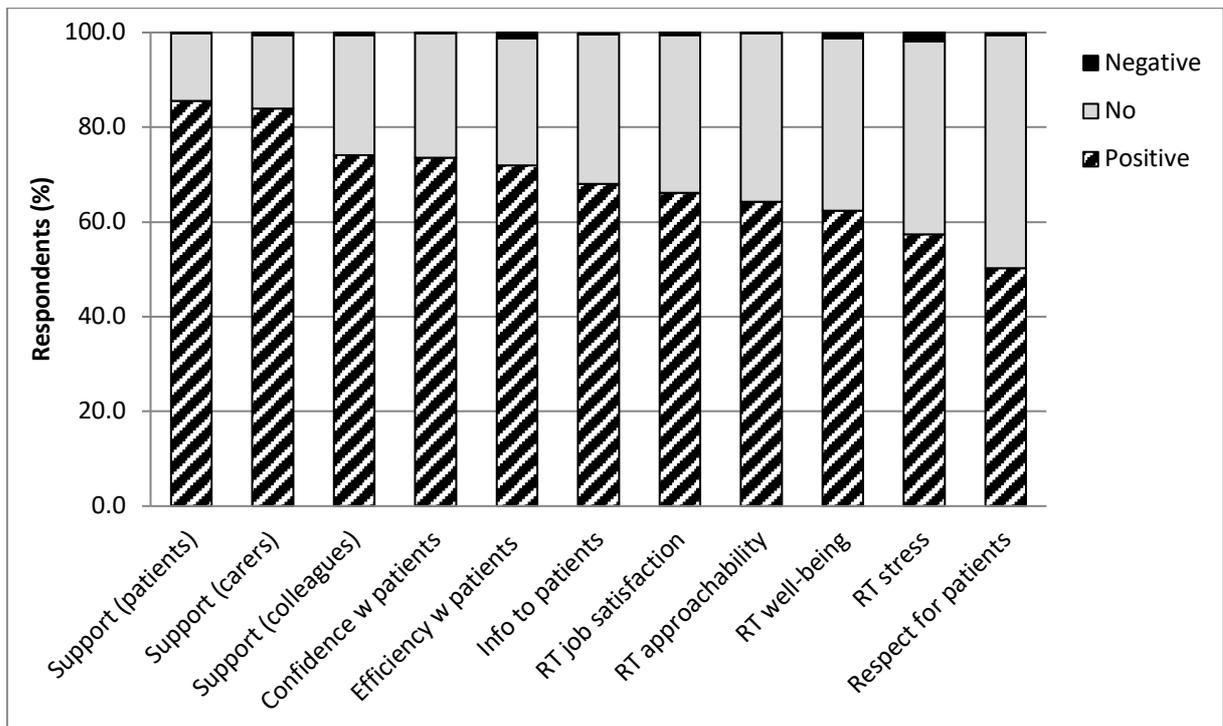


CST - Communication skills training. ANZ – Australia and New Zealand.

Figure 4.5. **Perceived motivation to complete CST by country**

#### 4.3.3. *Perceived effect of CST on self and work*

Most respondents reported positive effects of CST with the two most frequently endorsed options being: *support for patients*, 498 (85.6%); and, *support for carers/significant others*, 489 (84.0%) (Figure 4.6). Additional nominated effects of CST related mostly to workplace culture, professional relationships, management, teamwork, and conflict resolution.

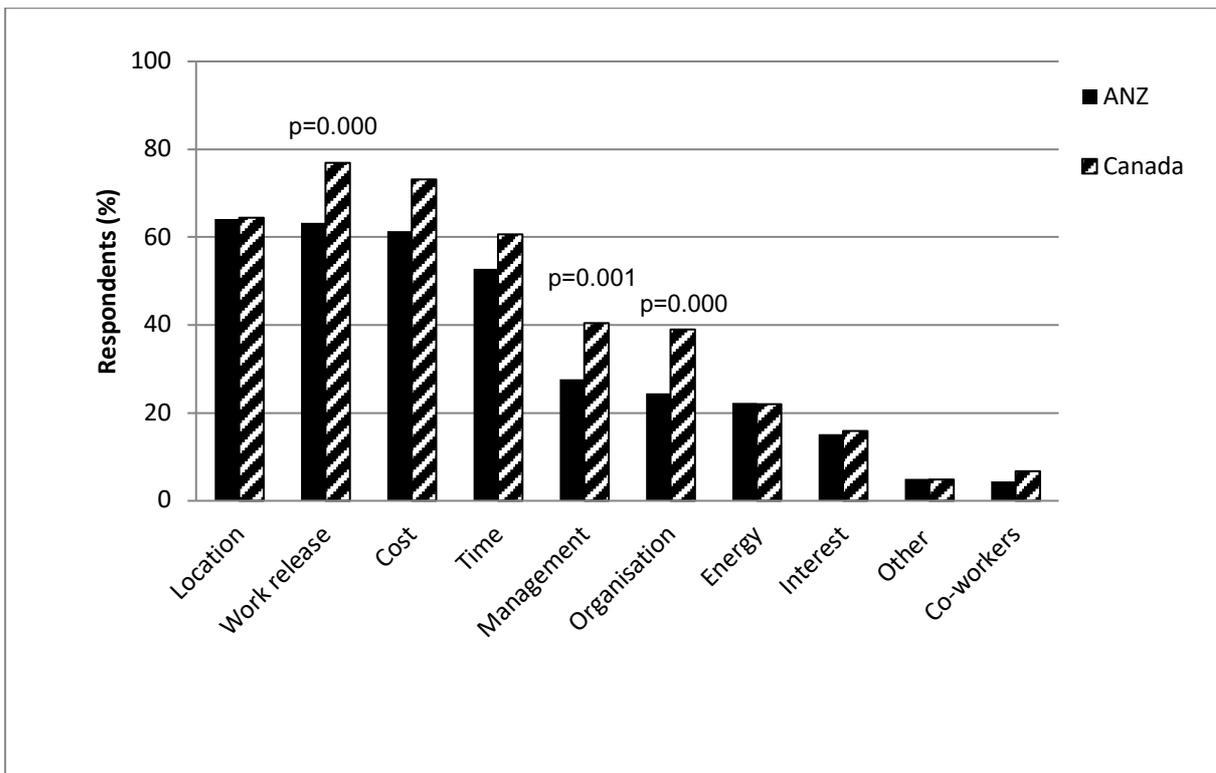


Other effects of CST were listed by respondents. These included: workplace culture and communication 86, personal skill development 36, mentoring/educating/feedback 14, patient communication and safety 14, and other 7. 4 responses were not relevant.

Figure 4.6. Perceived effects of CST

#### 4.3.4. Perceived barriers to CST

Overall, the four most frequently endorsed barriers to CST were: *work release*, 404 (69.4%); *course costs*, 388 (66.7%); *course location*, 374 (64.3%); and, *personal time*, 328 (56.4%) (Figure 4.7). Canadian respondents perceived *work release* ( $p=0.000$ ), *support from management* ( $p=0.001$ ) and, *support from the organisation* ( $p=0.000$ ), to be significantly greater barriers than ANZ respondents. A moderate correlation was found, respondents who identified management support as a barrier were more likely to endorse organisation support as a barrier ( $r=0.600$ ,  $p=0.000$ ). Additionally, personal energy and personal time ( $r=0.344$ ,  $p=0.000$ ) were moderately correlated. Weak correlations found included: management and work release ( $r=0.321$ ,  $p=0.000$ ), organisation and work release ( $r=0.253$ ,  $p=0.000$ ), course costs and location ( $r=0.294$ ,  $p=0.000$ ).



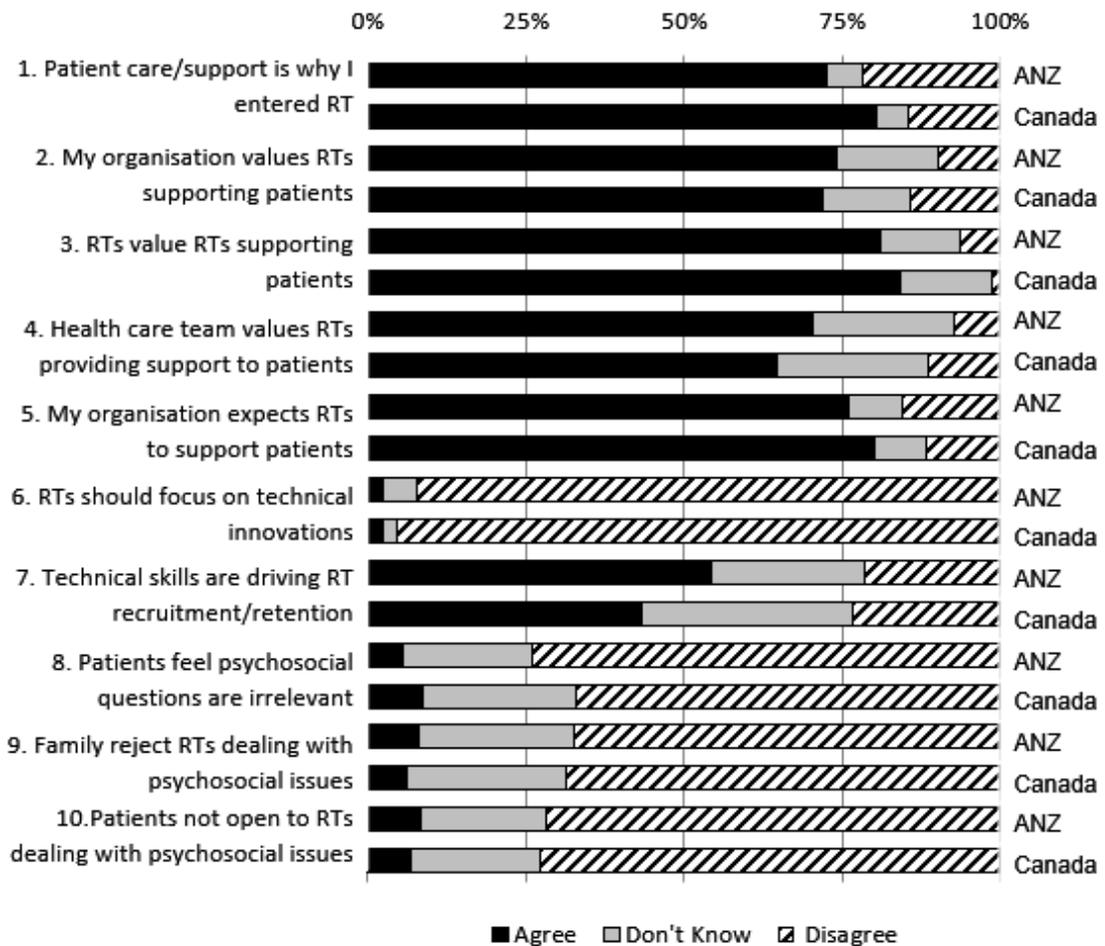
ANZ – Australia & New Zealand.

Significant differences between country groups for: work release (release time form work to attend training)  $p=0.000$ ; management (managerial support)  $p=0.001$ ; and organisation (organisational support)  $p=0.000$ .

Figure 4.7. **Perceived barriers to accessing CST**

#### 4.4. Perceived value of radiation therapist-patient interactions

Overall, statements with the strongest agreement were: *other RTs value my role in supporting patients*, 480 (82.5%); *my organisation expects RTs to support patients*, 453 (77.8%); and, *patient care and support is why I entered RT*, 443 (76.1%). The statement with the least agreement was: *RTs should focus on technical innovations*, 14 (2.4%). No significant differences were found between groups (Figure 4.8) (Appendix 12).

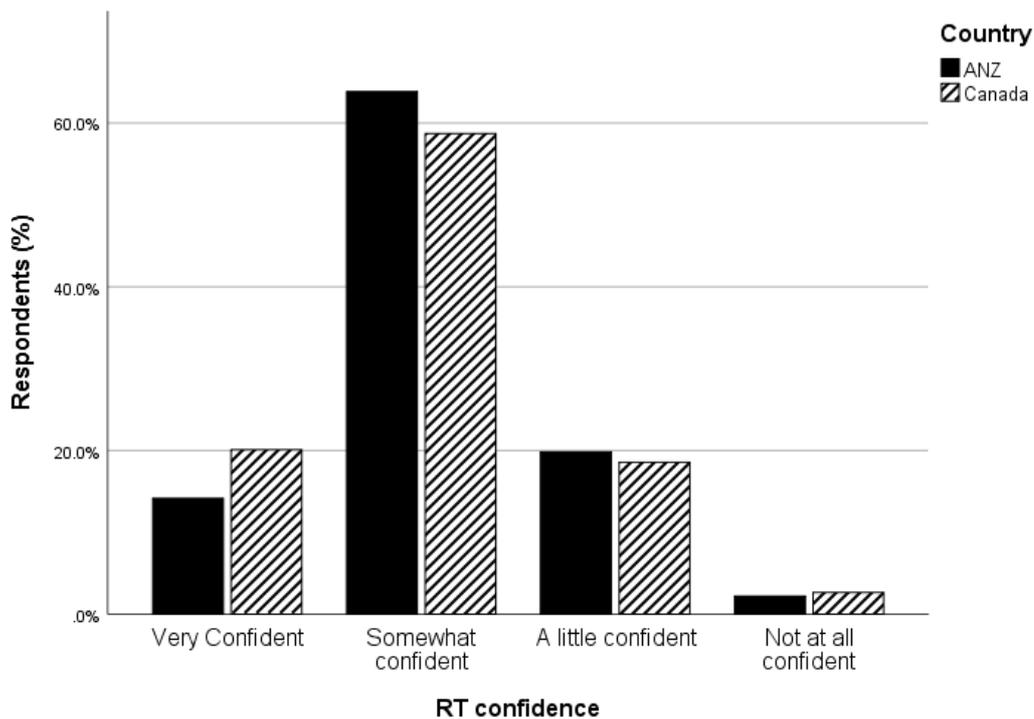


Paired responses to items 1 to 10 (on the left) by country ANZ or Canada (on the right).

Figure 4.8. **Perceived value of radiation therapist interactions with emotional patients**

#### 4.5. Radiation therapist confidence and perceived impact of anxiety

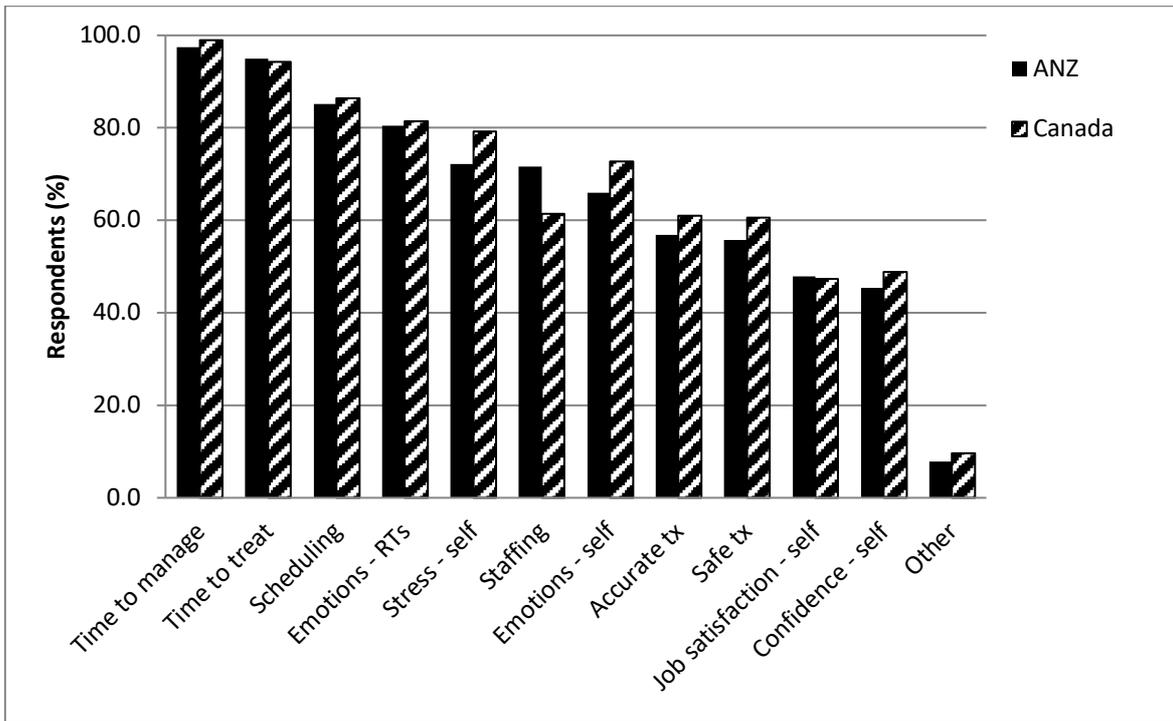
On a four-point scale, RTs reported being *somewhat confident* dealing with people exhibiting signs of anxiety, 203 (63.8%) ANZ and 155 (58.7%) Canada. No significant differences were found between groups (Figure 4.9).



ANZ – Australia and New Zealand; RT – Radiation therapist

Figure 4.9. **RT confidence when dealing with an anxious patient**

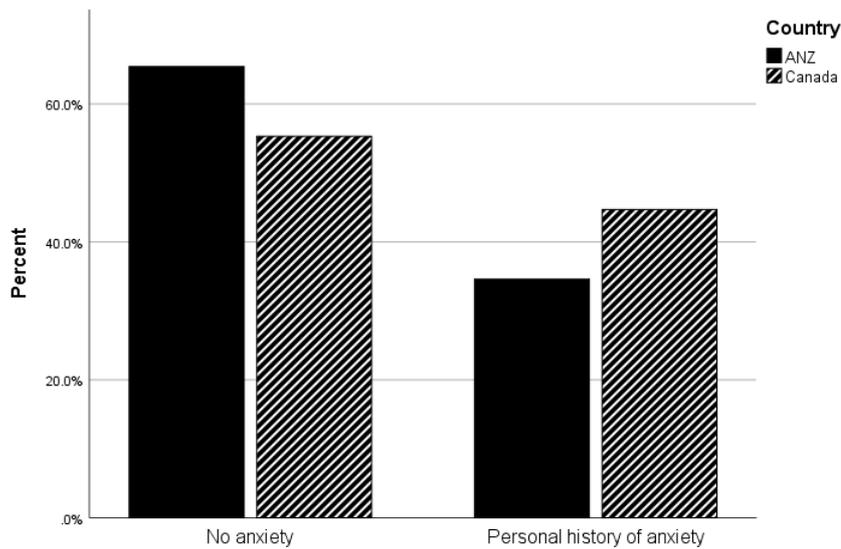
Participants were asked to identify aspects of treatment impacted when a patient is anxious. Time was a common factor in the three most frequently endorsed responses: *time to manage patient* 309 (97.5%) ANZ and 261 (98.9%) Canada; *time to treat patient* 301 (95.0%) ANZ and 249 (94.3%) Canada; and *daily appointment schedule* 270 (85.2%) ANZ and 228 (86.4%) Canada. The least endorsed responses were: *job satisfaction* 152 (47.9%) ANZ and 122 (47.3%) Canada, and *confidence* 144 (45.4%) ANZ and 129 (48.9%) Canada (Figure 4.10). No significant differences were found between groups.



RT – Radiation therapist; tx – treatment; ANZ – Australia and New Zealand.

Figure 4.10. **Perceived effects of anxiety on radiation therapy processes**

When asked if RTs had experience dealing with anxiety outside of work, the proportion confirming experiences with anxiety were similar, 229 (72.0%) ANZ and 201 (76.1%) Canada. The number who reported this as a personal history of anxiety was 110 (34.6%) ANZ and 118 (44.7%) Canada, or 228 (39.2%) overall. No significant differences were found between groups (Figure 4.11).

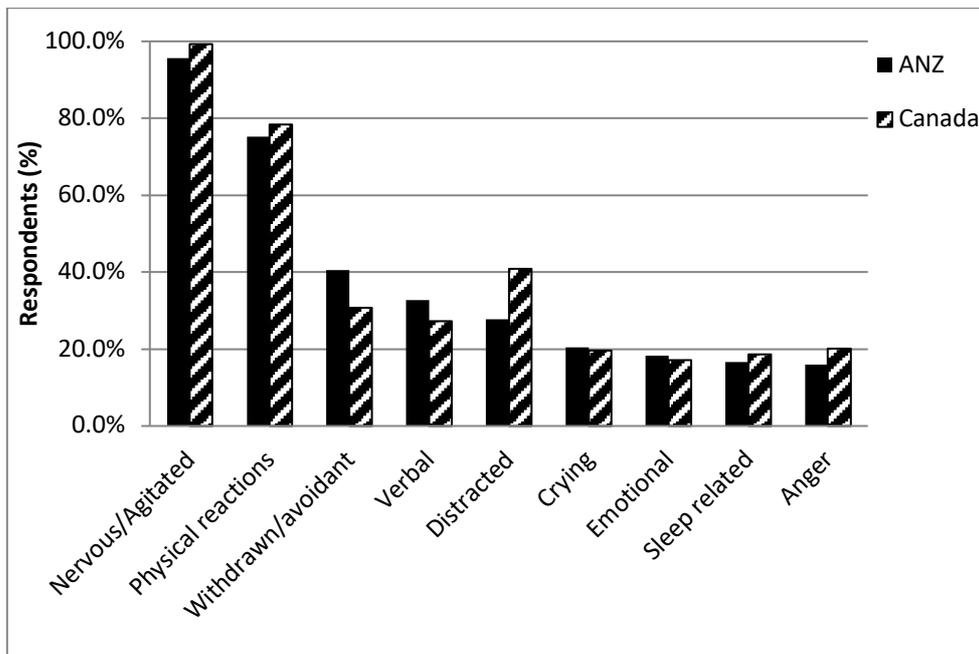


ANZ – Australia and New Zealand.

Figure 4.11. RTs personal history of anxiety

#### 4.6. Signs of anxiety

Most respondents identified three or more signs of anxiety. In total 522 (89.7%) RTs listed 2069 signs. Using content analysis, 2020 (97.6%) signs of anxiety were grouped into nine categories, with 49 (2.4%) signs considered uncodeable (Appendix 14). The two most frequent categories nominated were: *nervous/agitated behaviour*, 304 (95.6%) ANZ and 262 (99.2%) Canada; and *physiological reactions* (e.g. rapid breathing, sweating) 239 (75.2%) ANZ and 207 (78.4%) Canada. (Figure 4.12). No significant differences were found between groups.



ANZ – Australia and New Zealand. Other - uncodeable 19 (6.0%) ANZ and 30 (11.4%) Canada.

Figure 4.12. **Signs of anxiety listed by RTs**

#### 4.7. Detecting and managing patients experiencing anxiety - Vignettes

All respondents completed at least one vignette item. More respondents completed items 1 and 3 (multiple choice) than item 2 (free text) (Table 4.3). Results are presented for the sample overall as only two significant differences between country groups were found.

Table 4.3. **Completed responses by vignette and question**

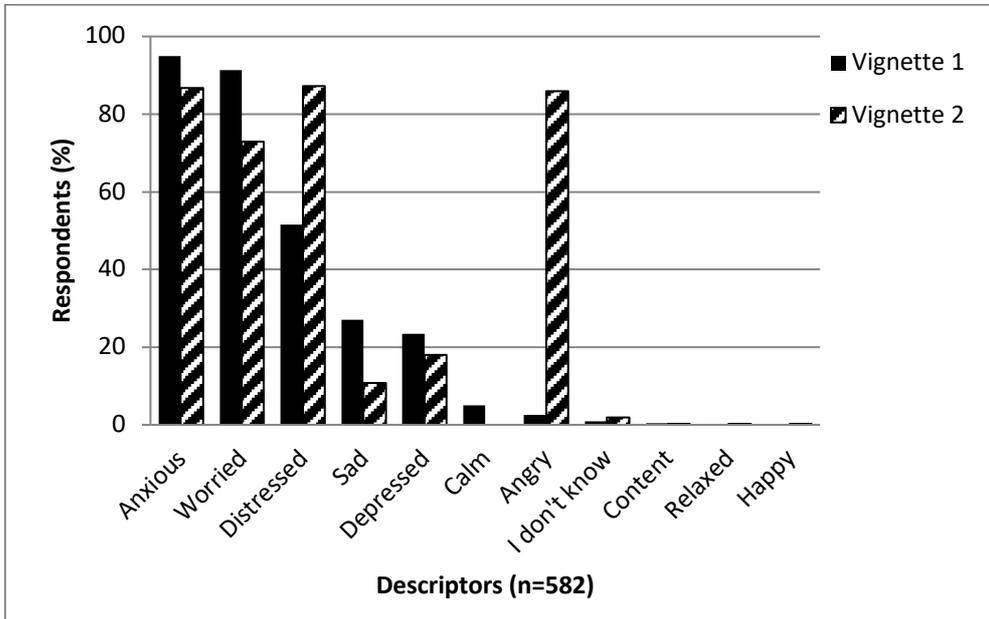
Vignette	Respondents (n=582)		
	Item 1 Descriptors (multi-select)	Item 2 Indicators (free-text)	Item 3 Management Strategies (multi-select)
1 (Alex)	582	540 (92.8%)	581 (99.8%)
2 (Pat)	582	527 (90.5%)	580 (99.7%)

##### 4.7.2. Item 1 - Descriptors

Almost all respondents endorsed at least one relevant descriptor: vignette 1, 577 (99.1%); vignette 2, 579 (99.5%), respectively (Appendix 15).

The two most frequently endorsed responses in vignette 1 were: *anxious*, 553 (95.0%); and, *worried* 532 (91.4%), accounting for 62.7% (1085/1730) of responses (Figure 4.13).

The four most frequently endorsed responses in vignette 2 were: *distressed*, 508 (87.3%); *anxious*, 505 (86.8%); *angry* 500 (85.9%); and, *worried* 424 (72.9%). These accounted for 91.4% (1937/2118) of responses (Figure 4.13).



Response options with less than 5% endorsement were considered spurious and not included in further analysis.

Vignette 1 - Relevant descriptors - anxious, worried and distressed. Vignette 2 - Relevant descriptors - anxious, worried, distressed and angry.

Figure 4.13. **Vignettes 1 & 2 - Endorsed descriptors of anxiety**

#### 4.7.3. Item 2 – Key indicators

In vignette 1, relevant indicators in order of most to least frequently endorsed were: *fiddling keys*, 467 (80.2%); *sleep issues*, 416 (71.5%); *nauseous*, 386 (66.3%); *concern about lying still*, 322 (55.3%); and, *being quiet*, 321 (55.2%) (Figure 4.14).

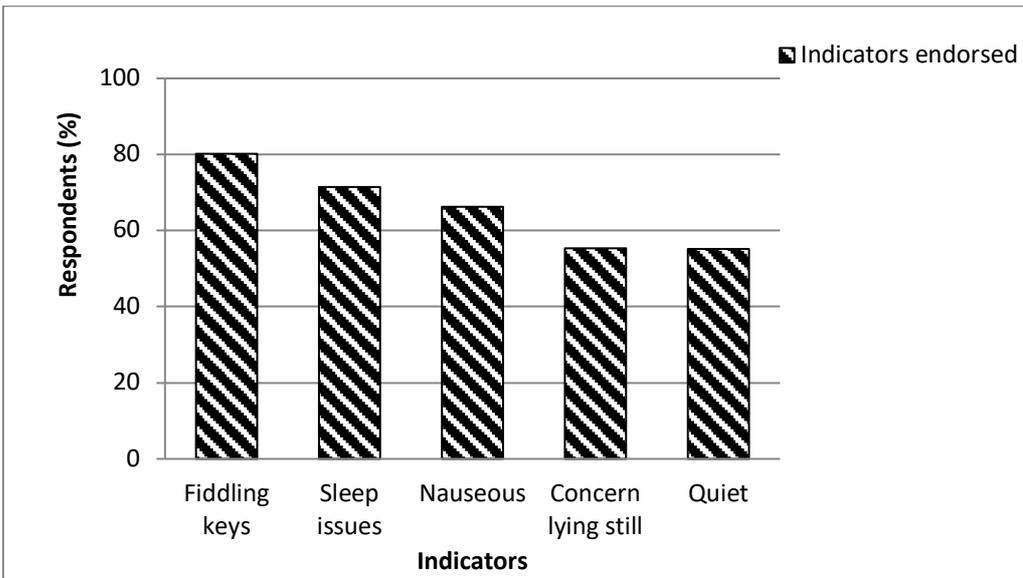


Figure 4.14. **Vignette 1 – Endorsed indicators of anxiety**

In vignette 2, relevant indicators in order of most to least frequently endorsed were: *rushed/agitated*, 419 (72.0%); *not listening*, 387 (66.5); *complaining/concern about treatment not fitting into daily life*, 261 (44.8%); *many questions*, 231 (39.7%); *demanding to see doctor*, 167 (28.7%); and, *not wanting tattoos*, 135 (23.2%) (Figure 4.15) (Appendix 16).

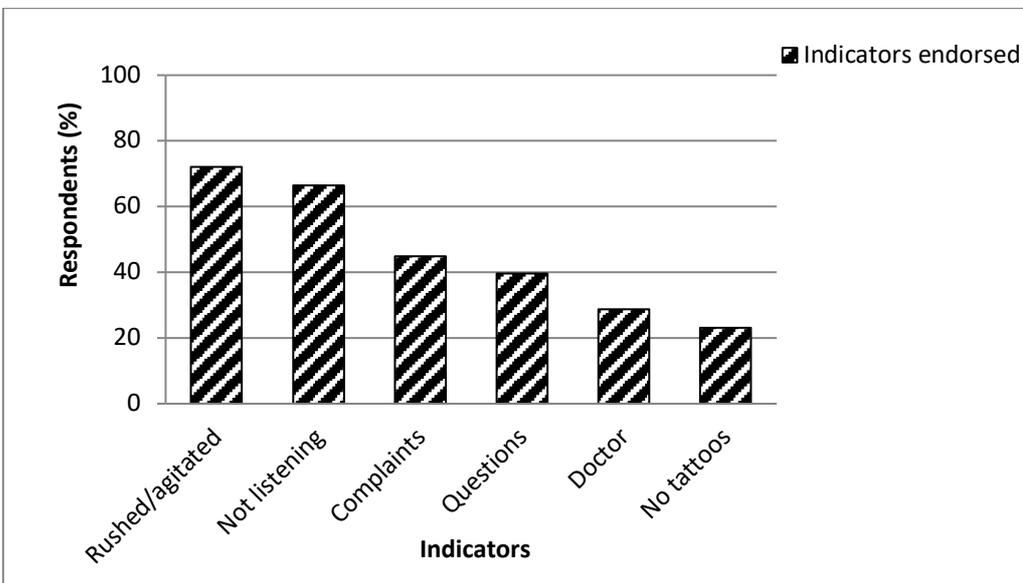


Figure 4.15. **Vignette 2 – Endorsed indicators of anxiety**

#### 4.7.4. Item 3 - Management strategies

Respondents who selected anxious in item 1 formed the subset for analysis of item 3. Most selected two or three relevant management strategies for each vignette with no significant differences between groups regarding number of strategies endorsed (Appendices 17-18).

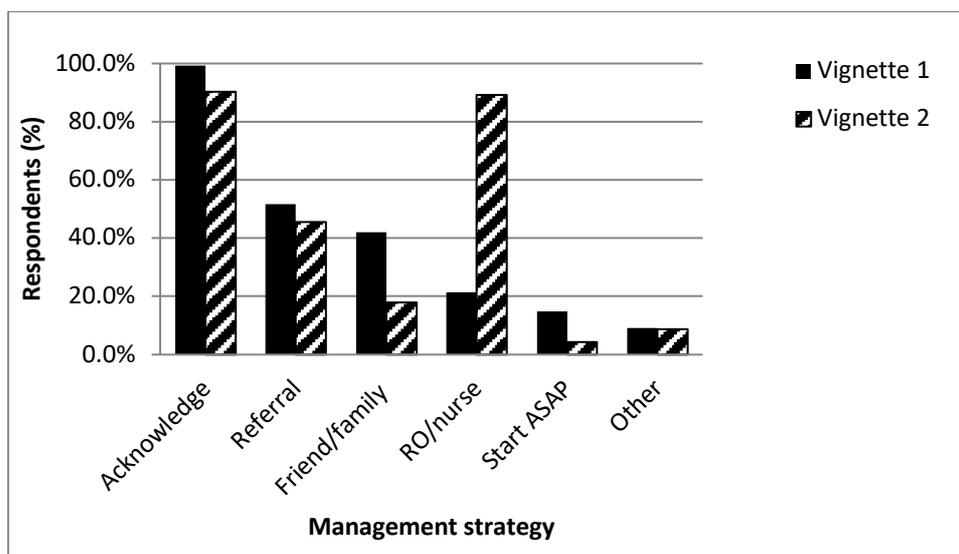
In vignette 1, management strategies endorsed were: *acknowledge and encourage*, 548 (94.2%); *discuss referral with patient*, 285 (49.0%); *involve friend/family in set-up*, 232 (39.9%); *contact RO/nurse prior to treatment*, 118 (20.3%); *tell patient not to be concerned/get started quickly*, 82 (14.1%); and *other*, 50 (8.6%) (Figure 4.16). Two significant differences were found. More ANZ RTs endorsed *contact the RO/nurse prior to treatment* ( $p=0.000$ ); and more ANZ RTs endorsed *involving the patient's friend in treatment set-up* (0.001).

All respondents who selected *other* and provided free text strategies to manage the patient, had classified the patient as anxious. Free-text responses included: provide more patient education and reassurance (e.g. spend more time with patient, converse in a private space); provide physical comfort; explore history/symptoms/ medications; explore social supports; include family/friends in information sharing, education or tour of the treatment room; monitor and reassess needs after treatment or at subsequent appointments.

In vignette 2, management strategies endorsed were: *acknowledge and encourage* 455, (78.2%); *contact RO/nurse prior to treatment*, 450 (77.3%); *discuss referral with patient*, 230 (39.5%); *suggest involving friend/family in treatment set-up*, 90 (15.5%); and, *tell patient not to be concerned/get started quickly*, 22 (3.8%) (Figure 4.16). *Other* was endorsed by 44 (7.6%) respondents who described the patient as anxious, and 4 (0.7%) who did not.

Free text responses were similar to vignette 1 and included: provide more patient education and reassurance; delay or reschedule appointment; discuss appointment schedule to accommodate patient needs if possible; ensure patient understands their options to consent/decline treatment; explore social supports; monitor and reassess needs after procedure or at subsequent appointments.

Two respondents (0.3%), one per vignette endorsed *tell patient not to be concerned/get started quickly* as the only strategy.



Missing data = 3 (one respondent in vignette 1, and two in vignette 2). Response options with less than 5% endorsement were considered spurious and not included in further analysis. RO – Radiation oncologist; ASAP – as soon as possible.

Figure 4.16. **Vignettes 1 & 2 - Endorsed management strategies**

Post hoc analyses explored the impact of demographic variables on confidence dealing with anxiety and ability to detect and manage anxiety. Number of years of experience, training in communication or emotional care, and personal experience did not significantly affect these variables. The exception was significantly higher RT confidence of those who had completed training in anxiety and depression ( $p=0.002$ ) compared to those who had not.

The aim of this research was to explore RT ability to detect and manage patient anxiety.

Results are articulated below in line with defined research objectives:

1. The majority of RTs demonstrated knowledge to detect and manage patient anxiety with 522 (89.7%) respondents able to list relevant signs of anxiety. Secondly, 553 (95.0%) and 505 (86.8%) detected the patient to be anxious in vignettes 1 and 2 respectively, and only two (0.3%) respondents overall did not endorse any relevant management strategies.

2. RTs are not required to complete training focussed on detecting and managing patient anxiety, 180 (30.1%) respondents reported not having training across any of the five relevant

domains – *communication skills, emotional cues, psychology, counselling, anxiety and depression.*

3. The majority of RTs reported being *somewhat confident* in their ability to communicate effectively with patients with anxiety, 358 (61.5%); compared to 98 (16.8%) who reported feeling very confident, 112 (19.2%) who reported little confidence, and 14 (2.4%) who reported no confidence.

Secondary aims were to explore the effect of individual characteristics on ability to detect and manage anxiety. There was no strong evidence to support the impact of - country of practice, years of experience, training completed, and/or personal experience – on ability to detect and manage patient anxiety.

## CHAPTER 5. DISCUSSION AND RECOMMENDATIONS

### 5.1. Overview

This research is novel as it surveyed a large international group of RTs and demonstrated substantial interest in RTs and psychosocial support. The research focussed on RT ability to detect and manage anxiety, as a specific component of patient-related psychosocial needs. This was explored largely using patient-focussed vignettes. The novel findings are summarised here and discussed in detail below.

- The majority of respondents perceived CST as relevant to their role and indicated moderate-to-strong motivation to complete CST, however approximately one third of respondents had not completed any form of training related to communication skills and emotional care.
- The majority of respondents reported feeling *somewhat* or *very* confident when dealing with a patient with anxiety, as opposed to *little* or *no* confidence.
- The majority of respondents correctly identified overt signs of anxiety.
- The majority of respondents correctly identified vignette patients as anxious and endorsed appropriate strategies to manage anxiety.
- The majority of respondents demonstrated willingness to engage with the patient and/or multidisciplinary team to manage anxiety.

### 5.2. Training in communication skills (CST) and emotional care

#### 5.2.1. *Type of training completed*

To assess impact of training on skills in detecting and managing anxiety, RTs were asked if they had completed any form of training in the following domains: *communication skills*, *emotional cues*, *psychology*, *counselling*, or understanding *anxiety and depression*.

Approximately one third of respondents had not completed training in any of these domains.

CST was explored as an option potentially able to enhance RT ability to detect and manage patient anxiety. This was based on evidence that communication skill development in other HCPs has improved aspects of communication, such as expression of empathy and use of open questions (19, 20). Training in communication skills was the most common training completed with significantly more ANZ RTs having completed CST within the last 5 years (0.001) compared with their Canadian peers. This is possibly an artefact of the Australian RT PREPARE trial, in which RTs completed a formalised CST program and the impact of this training and skill development on patient knowledge, preparedness for treatment, and anxiety levels were measured, as previously discussed (13).

The word 'training' was used broadly here. It did not refer explicitly to undergraduate or post-graduate curriculum but encompassed on the job training, in-service education, online training, short courses, and workshops, etc. However, it is noteworthy that two undergraduate radiation therapy programs, in NZ and Australia, have recently implemented CST workshops to develop students' communications skills with trained actors prior to interacting with patients on clinical placements (74, 75). Incorporation of this training at undergraduate level highlights the perceived importance and relevance of this skillset to the RT profession. Therefore, regular training and maintenance of skills for the current workforce is important to enable support for students and graduates developing these skills, and to support patients and the oncology workforce by influencing the workplace culture to value communication skills and psychosocial support.

#### *5.2.2. Perceived need and motivation to complete CST*

The perceived need and motivation to complete CST, was rated moderate-to-strong. Need and motivation were strongly and positively correlated. Therefore, RTs who perceived a need to complete CST were likely to be motivated to do so; and those who did not identify a need, were likely to lack this motivation. Those who indicated low or no need may have previously completed CST or may not perceive it as relevant to them or their role.

Some respondents expected RTs with longer professional experience to have more developed communication skills, and therefore be less likely to need or benefit from CST, compared to less experienced staff. Similarly, Larsen et al found RTs engaged more frequently in patient care did not perceive a strong need for further CST (33). However, as reported by Fallowfield et al, it is a misconception that communication skills automatically improve with time and experience (19). Conversely, Hulley reported a non-uniform relationship between longer professional experience and ability to communicate effectively, but concluded intrinsic factors, such as personal sociability, and extrinsic factors within the work environment, such as time, space and support, also influenced RT skills and effectiveness communicating with patients. In addition, Hulley noted less experienced RTs deferred to more experienced RTs to deal with emotional patients. This indicates that more experienced RTs may provide mentoring and support to enhance skill development and confidence of less experienced RTs (46). Mentoring and clinical supervision is an approach reported as effective in nursing, particularly in relation to enhancing skills including communication and psychosocial care provision, and therefore may have a significant role to play in radiation therapy (15, 76, 77).

### 5.2.3. *Perceived effect of CST on self and work*

Most RTs agreed CST would positively impact all patient-related domains including respect for patients, provision of information and emotional support. A positive impact was also perceived for professional domains including RT confidence, approachability, job satisfaction, well-being, work-related stress, support for colleagues, and efficiency.

Respondents volunteered additional information that CST could address existing workplace issues such as professional relationships, management, conflict resolution, and teamwork. Whilst these issues have been previously reported as negatively impacting RT coping strategies, burnout, and workforce attrition, little evidence exists to demonstrate interventions have been explored or implemented (78-82). In addition, professional capability standards defined by regulatory associations such as the Medical Radiation Practice Board Australia (MRPBA) define practice domains that must be met and adhered to by professionals and

oncology centres to meet legal obligations and duty of care. The first two domains “Professional and ethical conduct” and “Professional communication and collaboration” are broken down into requirements to “establish and maintain effective and respectful working relationships with health practitioners” and “advocate on behalf of the patient/client” (27). Ability to fulfil these professional and legal requirements is likely to be challenged in working environments where professional relationships, management, conflict resolution, teamwork, RT coping strategies, burnout, and workforce attrition are identified as issues. Respondents’ proposed CST may be a first step to resolving these issues and nominated multiple potential improvements following CST related to personal and professional development; physical, mental and emotional well-being; and workplace collaboration and culture. These issues must be addressed to maintain a safe working environment and minimise risk of harm to staff and patients.

CST could increase RT ability to detect and manage patient anxiety. This is supported by studies that report patient anxiety can be decreased following effective and compassionate communication initiated by HCPs. Halkett et al reported that 218 patients, who attended one-on-one information and education sessions led by RTs who had completed CST reported significantly lower anxiety at treatment commencement, than the usual care group of 190 patients, as previously discussed (13). Fogarty et al reported on a study of 206 women which showed a significant decrease in STAI-S scores (pre-post) of women who viewed an ‘enhanced compassion’ video consult with a physician containing 40 seconds of compassionate communication, compared with those who viewed the ‘standard’ video (12). Additionally, a systematic review conducted by Moore et al reported that CST which incorporated learner-centred objectives and experiential role plays improved communication with patients through use of open questions, expressions of empathy, and ability to build trust and rapport to encourage information sharing (20). Oncology workforce participants in CST studies have reported CST to be informative, clinically relevant, and satisfying, and successful in increasing confidence and self-efficacy communicating with patients and colleagues (14, 19, 23, 83).

As a result of this research, it is recommended that CST be delivered in two distinct components to target: 1. professional-patient communication, and 2. inter-professional communication, to enhance detection and management of patient anxiety and improve identified workplace issues.

#### 5.2.4. *Perceived barriers to CST*

CST programs are currently available, however almost half of the respondents had not attended. Perceived barriers to this type of training were explored. Practical and logistical issues were most frequently reported, noting *lack of work release, managerial and organisational support* were significantly greater barriers in Canada than ANZ, which suggests systemic differences regarding accessibility and support to attend CST.

Respondents described management and organisations as unsupportive of work release to attend CST which reiterated concerns of lesser willingness to support and fund training related to non-technical skills, previously raised by Bolderston (35). Similarly, oncology nurses have expressed a perceived lack of support to attend training in providing care for emotionally distressed patients, due to time away from work, limited staff and finances (16). RTs conveyed work release and funding requests to attend CST were likely to be rejected by managers or organisations, thus discouraging staff from applying. This is self-perpetuating, as staff may not apply to attend CST if they perceive little support, and this absence of applications may lead managers and organisations to conclude staff are not interested or needing CST. Without this support, RTs may consider *personal time and energy, cost and location* too challenging to overcome and not complete training in communication and emotional care domains.

*Location* was a barrier perceived to be related to distance and transport to courses. In a clinical environment, training sessions are often conducted informally and 'in-house' or 'on-site' (e.g. education rounds, in-services) to maximise attendance and minimise service disruption. Therefore, one solution to overcome location barriers could be to run tailored workshops in the radiation oncology department, for the multidisciplinary workforce (84).

This offers the ability to train more staff and improve multidisciplinary relationships through shared training experiences, while minimising perceived barriers. This approach requires support from management and organisations to ensure sessions are effective, cost-efficient and sustainable, and protected time is provided to support attendance (85).

Another potential way to minimise barriers to training relates to flexible course delivery. To simulate the clinical environment and enable experiential learning, CST is often delivered as facilitated face-to-face workshops, incorporating active participation and role playing.

Delivery of CST programs could be diversified to integrate multiple models such as online pre-reading and theory, tele-video mentoring, recorded interaction sessions for review and feedback, in-house mentoring/clinical supervision or involvement of advanced practitioner RTs, or virtual reality systems such as VERT (14, 45). Although a systematic review reported it is unclear which methods of CST delivery are most effective, these studies did not involve RTs and were not specific to RT needs (20). Therefore, integrated approaches tailored to professions must continue to be developed and evaluated prior to widespread adoption.

### **5.3. Perceived value of radiation therapist-patient interactions**

RTs indicated their involvement in supporting patients was valued by their organisation, colleagues, and patients. These results supported Hulley's findings that providing patient care and support was the main reason respondents joined the profession, and patient care should be the primary focus of the RT profession rather than technical innovations (46).

Respondents values aligned with psychosocial care guidelines, and RT role definitions and capability statements defined by professional and regulatory associations (2, 27, 86-88).

Additionally, the expectation to detect and manage patient psychosocial needs aligned with RT-reported job satisfaction derived from supporting patients and 'making a difference', professional confidence and esteem, positive relationships with colleagues, and role clarity (33, 79, 80). Conversely, work-related stress and burnout can increase when RTs feel unable to help patients due to professional issues, including lack of skills or confidence

supporting and communicating with patients and, systemic issues including workload, time constraints, lack of private spaces and lack of support (78, 80). These findings highlight RTs are expected to provide skilled and effective psychosocial care to patients and these skills are valued by colleagues, organisations and patients.

Emotional intelligence is another factor that may impact RT abilities, confidence, stress and burnout (89-91). However, little research regarding emotional intelligence of RT professionals and RT students has been undertaken.

An important misalignment of views was detected in relation to expectations of RTs to provide psychosocial care. Respondents reported management, organisations, professional associations, and colleagues expect and value RT provision of support to patients; yet, RTs perceived training opportunities related to non-technical skills, such as communication and psychosocial care, were less likely to be endorsed by management. One possible explanation for this misalignment is the misconception that communication skills are part of an existing skillset which improves with time and does not require training. However, as discussed earlier, this is evidenced to be untrue (19). Meanwhile, a lack of these skills increases the risk of not meeting legal and professional capabilities relating to effective communication with patients and colleagues. As such RT abilities to obtain informed consent prior to procedures, assess a patient's capacity and behaviours to receive care, detect and manage psychosocial needs including anxiety may be compromised (27). In addition, a lack of communication skills is negatively impacting RTs due to an association with compassion fatigue, burnout, and workforce attrition (78, 80).

Another misalignment is psychosocial care being expected and valued in an environment reportedly 'not conducive' to providing it. Multiple studies indicate physical radiation oncology environments focus on technology and patient throughput. Departments commonly lack private spaces, and RTs and patients frequently articulate time and space as factors limiting anything other than technical care (2, 9, 43, 46, 92). This can result in a poor psychosocial climate which increases patient distress and anxiety, decreases perceptions of

comfort and safety, and decreases willingness to engage with HCPs and share information (11). This may impact both staff and patients as Grulke et al reported increased patient distress and anxiety positively correlated with distress experienced by oncology nurses. Whilst unable to determine the exact nature of this relationship, Grulke et al concluded interventions aimed at improving the psychosocial climate and decreasing staff distress, may decrease patient distress and improve oncology care (93).

Multiple studies have discussed interventions aimed at decreasing staff and patient distress without increasing workload or compromising treatment delivery. Interventions included: increasing awareness of psychosocial guidelines; implementation of clinical pathways and increasing use of screening tools to detect psychosocial needs; providing accessible private spaces for interactions with patients; RT training in communication; providing patient education and counselling; assessing RT workloads and appointment schedules to evaluate time required for effective communication and psychosocial support; and improving stress management and coping strategies for RTs (3, 13, 33, 46, 60, 81, 92, 93). These may be applicable to RTs in the radiation oncology environment and should be further explored.

#### **5.4. Radiation therapist confidence and perceived impact of anxiety**

Patients routinely experience anxiety throughout their treatment (13). Pre-treatment anxiety is experienced by many patients and tends to subside as treatment progresses; mid-treatment anxiety can occur when side-effects impact the patient's daily activities; and late-treatment anxiety may occur as the patient prepares to move on from the treatment routine and daily support (6, 7). It is, therefore, reasonable to assume RTs are confident dealing with anxiety; however, one fifth (21.6%) of respondents rated themselves as having little or no confidence dealing with patients experiencing anxiety. Hulley estimated between one third to one half of 199 respondents, lacked sufficient confidence and knowledge to support emotional patients and were not satisfied with the level of care they provided (46). Similarly, Halkett et al and Dong et al, reported that RTs are more confident providing technical and procedural information than information related to psychosocial needs (34, 49). A lack of knowledge regarding psychosocial needs, lack of communication skills to engage in these

discussions, or a perceived lack of experience with patients experiencing anxiety are speculative reasons for this lack of confidence (2). In addition, lack of confidence may relate to prioritising practical and technical communications with patients due to time and space limitations, therefore minimising opportunities to engage in psychosocial care (92).

Post hoc analysis showed neither age nor years of experience had an effect on RT confidence. However, those who completed training focussed on anxiety and depression were significantly more confident dealing with anxiety. This aligns with Lavergne et al who found experience did not impact on confidence, but education to understand anxiety and depression was reported as the second most positive factor affecting RT comfort levels in dealing with emotional distress. The first most positive factor was experience with patients with anxiety and depression (84).

This research is unable to determine causes related to lack of confidence; therefore, causal relationships could be explored in future research. However skills in communication and provision of psychosocial care are perceived as an integral part of the RT role and are defined in professional capability requirements (27). Consequently, all RTs should have skills and confidence to communicate effectively and detect and manage psychosocial needs, such as anxiety.

Respondents agreed anxiety impacts multiple aspects of treatment including time, staffing, emotions, stress levels, physical resources, treatment safety and accuracy. This confirms findings from multiple studies where lack of time and schedule delays, and low staffing numbers were commonly reported as barriers to effective communication. Hulley reported 147 (74%) of 199 RTs practicing in Canada felt that time, private space and staff numbers were inadequate to enable communication with patients with psychosocial needs; Bolderston et al reported a lack of time to spend with patients and a departmental focus on patient throughput; Absolom et al interviewed medical and nursing staff who stated caring for patients experiencing emotional distress was a time burden; and Clover and Oultram et al stated interventions were required to minimise the effect of patient anxiety on RT distress,

scheduling delays and potential impact on patients awaiting treatment (10, 16, 30, 35, 46, 60, 92, 94).

Treatment accuracy and safety were also perceived to be impacted by anxiety. This is supported by Mullaney et al and Egestad who reported on effects of RT behaviour, the physical environment and culture. Rushed communications, lack of empathy, scheduling delays requiring patient transfers to an unfamiliar treatment unit and team, can all reduce feelings of safety, increase fears of inaccurate treatment and thus, increase anxiety (10, 11, 43). This reinforces the importance of early detection and effective management of anxiety, to benefit patients and staff.

Anxiety amongst HCPs may impact patient anxiety as previously discussed. According to publicly available data, common anxiety disorders affect approximately 11-16% of populations in Australia, NZ and Canada, in a 12-month period (95-97). In this research, 39.2% of respondents reported a personal history of anxiety which is more than double the rate of the general population. This result may be inflated due to bias, if RTs with a history of anxiety were more likely to participate in the survey; and because 'anxiety' was not further defined. Results may reflect a broad range of severity and diagnoses and include existing and past experiences. This was a novel finding and was not compared to anxiety rates for other HCPs. Nonetheless, these results are concerning as anxiety is linked to poorer health and functioning, hence presenting an increased risk to the oncology workforce and their patients (93, 98).

#### **5.5. Detecting and managing patients experiencing anxiety**

Results demonstrated RTs are able to recognise overt signs of anxiety. The most frequent signs of anxiety nominated by RTs were *nervous/agitated behaviours*, and *physiological reactions* (Appendix 13). Vignette results provided further evidence that RTs recognise overt signs of anxiety including fiddling, and verbalised concerns relating to sleep and nausea in vignette 1; rushed and agitated behaviours and not listening in vignette 2. Vignette characters reflected different expressions of anxiety, and more RTs recognised the vignette 2

patient as anxious, than vignette 1 who presented with less overt signs of anxiety. Lower awareness of more subtle signs of anxiety could be interpreted as RTs lacking comprehensive understanding of signs and symptoms of anxiety. This gap may result in RTs failing to engage with patients exhibiting subtle signs of anxiety and therefore increase the likelihood of patients having unmet psychosocial needs.

Both vignettes reflected endorsement of management strategies within the realm of RT control. Almost all respondents endorsed *acknowledge and encourage* patient, indicating a willingness to engage and support patients. This suggests RTs are familiar with a reassurance approach and may use or intend to use it in clinical situations. Use of this strategy is supported by Oultram et al who observed RTs use verbal reassurance to reduce patient anxiety, and Egestad who reported patients valued verbal reassurance provided by RTs to encourage treatment completion (10, 30). Additionally, RTs were willing to facilitate multidisciplinary engagement through RO/nurse contact or discussion of referral to psychosocial services. Lavergne et al also identified RTs were willing to refer patients to social work staff for further support (84).

Management strategy *tell (patient) there is no reason to be concerned/get started as quickly as possible*, was endorsed more than expected. The intended interpretation of this option was the RT did not detect anxiety or wish to engage with the patient to explore possible concerns. However, some respondents may have viewed this as a way of reassuring patients and reducing their fear of the unknown by familiarising them with the treatment process. Alternatively, this may reflect a higher priority to remain on-time and minimise effects of schedule delays.

Few respondents suggested broader anxiety management strategies such as meditation/relaxation, support groups, music, physical exercise or activities, online resources or medication in this or other studies (30, 84). Almost all RTs who did suggest medication related it to management of pain, nausea, and insomnia, not anxiety. This potential lack of

awareness of medication and broader strategies in anxiety management may be due to multiple factors requiring further exploration, including a:

- lack of understanding of the impact of anxiety for patients during and after treatment
- lack of awareness of appropriate, available services and support systems
- lack of knowledge of benefits associated with other management strategies
- lack of skill and confidence to elicit patient concerns, discuss and facilitate potential management options
- perception that interactions with patients about anxiety and other psychosocial concerns are time intensive
- perception that detection and management of anxiety and other psychosocial concerns is not part of the RT role.

To improve the detection and management of anxiety and other psychosocial concerns, many multidisciplinary interventions have been proposed. However, few have been implemented and undergone systematic evaluation. Oultram et al suggested RTs form part of a two-tiered system where they detect and manage low level anxiety and provide timely psychosocial support to these patients, with higher needs patients being referred to the appropriate professional services, such as a psychologist or psychiatrist, for more comprehensive assessment and management (30). Similarly, Turner et al delivered 10 weeks of intensive training and clinical supervision to 27 oncology professionals (including 2 RTs) to enable them to detect low and medium level psychosocial needs and deliver basic interventions. HCPs learned to identify patients with high needs and refer to relevant services to ensure optimal care. HCPs reported training and clinical supervision were acceptable, and that attitudes and skills developed were applied to routine clinical practice. This intervention addressed some practical psychosocial concerns but proved insufficient to manage depression in the absence of other interventions (24). Butlin et al conducted a pilot study educating RTs to manage patient anxiety using PracticeCALM techniques. The 8-week course was delivered with ongoing supervision and mentoring. Assessment of learned

techniques implemented in routine practice, revealed improved ability in maintaining a calming presence, empathising with patients, skills and confidence to detect anxiety earlier and intervene in difficult situations, problem-solving with patients, and facilitating referrals to support services. Butlin et al also reported reduced use of anti-anxiety medications for patients, decreased RT stress and increased empowerment (47). Such training programs and anxiety assessment and management models should be further explored and implemented more broadly into routine clinical practice. These strategies could enhance RT skills in detecting and managing low level anxiety, facilitate appropriate use of specialised services and timely care for all patients, and potentially minimise the impact of anxiety and unmet psychosocial needs on patients and staff.

Another critical component of upskilling the RT workforce to improve skills in detecting and managing anxiety, is embedding skills into routine practice and enhancing the psychosocial culture radiation oncology environment. One potential solution to achieve this is to incorporate daily 'talk time' into all routine appointments. Multiple potential benefits of incorporating this strategy such as increased patient engagement, reduced anxiety and decreased staff time and burden are reported in the literature. Patients highlight communications such as greetings and informal conversation about interests and family as crucial to increased comfort, trust and engagement and to enable them to feel like a 'person', not a 'patient' (35, 38, 92). Consequently, these relationships create a perception of being united and providing encouragement and motivation to attend and complete treatment (10). In addition, regular engagement in 'talk time' between patients and HCPs has been reported to reduce overall staff time and resource burden (12, 99). An optimal period of 'talk time' in the daily schedule would need to be acceptable to patients, RTs and organisations and it is important to assess the effectiveness and economic effects as suggested by Larsen et al (33). This is a mutually beneficial strategy for HCPs and patients due to potential positive impacts on engagement, co-operation, information sharing, quality of care and time management (100).

RT facilitated introductions or endorsements may increase awareness and uptake of psychosocial services, as studies have reported patients feel more confident to ask questions and seek information once they have established a relationship with their HCPs including RTs (10, 38). RTs skilled in discussing psychosocial concerns may help normalise patients' feelings and overcome stigma associated with seeking support for psychological concerns by facilitating referrals and introductions to psychological services and personnel. This may also help to remove anecdotal concerns such as adding unfamiliar HCPs to the treatment team (2). In addition, integration of appointments, where practical, could enhance timely access, particularly if services are available on-site. RTs could also ensure patients are aware psychosocial services are available post-treatment. This could minimise the impact of issues such as depression, which are more likely to develop post-treatment when patients and healthcare teams have less frequent contact (6, 7).

## **5.6. Recommendations**

The objectives of this study have led to the following recommendations for potential points of intervention and evaluation:

1. enhance RT knowledge and recognition of less overt signs of anxiety,
2. ensure appropriate training in communication and psychosocial care to enhance RT ability to detect and manage patient anxiety, and
3. increase RT confidence when dealing with patients with anxiety by enabling RTs to provide effective psychosocial care.

Strategies to achieve these recommendations include increasing awareness and implementation of psychosocial care guidelines and clinical pathways for anxiety and psychosocial management; enhance multidisciplinary collaboration to improve communication and patient care; implement mandatory training in communication and emotional/psychosocial care; shape a culture valuing both technical and non-technical skills; incorporate practices such as daily "talk time" into routine appointments; and, RT facilitated introductions to psycho-oncology services/personnel. System-wide collaboration is essential

to achieve successful and sustainable implementation of recommendations to minimise risk of patients experiencing unmet psychosocial needs.

### **5.7. Strengths**

This research serves as a novel and broad exploration of RT perceptions and role in managing patient anxiety. The survey was designed after a rigorous systematic review identified gaps regarding RT ability to detect and manage anxiety (37). The survey consisted of existing tools and newly developed items, was pilot tested and refined prior to dissemination to the target population (67).

This large international RT survey facilitated international participation using an online survey platform and with the support of professional associations and promotion to their memberships. The sample was representative according to analysis of gender, age and experience, and the findings are generalisable to the broader RT population.

### **5.8. Limitations**

Multiple limitations were identified. Estimating a response rate was difficult due to inability to source non-aggregated data for RTs (i.e. not including all medical radiation technologists - diagnostic, nuclear medicine and RTs). Additionally, the invitation and survey were in English, potentially eliminating French-speaking Canadians.

The survey was susceptible to recall and responder bias, as RTs interested in psychosocial care, or with personal experiences with anxiety, may have been more likely to participate. Length of survey and use of existing tools, with a forced choice answer format (i.e. no neutral options) may have been barriers to survey completion (67). Following the pilot, the survey was shortened (but was still estimated to take 20-30 minutes) and existing tools were not modified to ensure comparability to previous research.

Respondents were asked to provide details of training completed in five domains – *communications skills, emotional cues, psychology, counselling, or understanding anxiety and depression*. It is acknowledged that training reported by respondents is likely to vary in

quality, content, method of delivery, and accreditation status, and have been undertaken at varying timepoints in their career. These variations have not been assessed in this research.

With respect to data analysis, descriptive analysis and inferential statistics were used to detect associations and differences between groups, however, this research was not designed to show causal relationships. Specific geographical information was not collected, and findings are not attributed to regions (e.g. metropolitan versus regional or rural).

Responses were not ranked therefore RT priorities could not be assessed, and RT experience was calculated assuming continuous practice between year qualified and date of survey closure, which may not always be true. Vignettes provided insights into how RTs approach psychosocial support with patients but were not designed with equal numbers of relevant and irrelevant indicators, and analysis was focussed on relevant indicators only. Lastly, response option *contact RO/nurse prior to treatment* in vignette 2, mistakenly refers to *treatment* instead of simulation, which was a minor oversight.

### **5.9. Future directions**

According to this sample, minimal differences exist between ANZ and Canadian RTs, in relation to skills, values, and knowledge gaps in providing psychosocial support for patients. Therefore, interventions and system changes aimed at training, upskilling and improving psychosocial support, will be relevant to RTs, radiation oncology settings and RT trainees in ANZ and Canada.

The impact of rapid technological advancements on the RT role must be considered to ensure future research is relevant to the workforce. Automation technology will reduce RT input into planning systems and manual control of equipment. However, the RT role of “humanising technology” by communicating with, advocating for, and supporting patients will continue to be valued and needed by patients, families, carers and RTs (35). Therefore, communication and patient care skills must be valued and supported within the profession.

Further research should explore aspects of planning and implementing strategies to support RT skill development in communication and psychosocial care. Incorporating training into

undergraduate radiation therapy programs is a positive step for emerging RTs (74). For qualified RTs, compulsory training in communication skills and psychosocial care should be integrated into existing mandatory registration and CPD programs in ANZ and Canada to increase skill development. Supporting regular updates and maintenance of these skills, and enabling RTs to use skills in clinical practice, will reinforce them as valued components of the role and will support the professional capability frameworks. Methods of training delivery need ongoing development and evaluation to ensure identified barriers are overcome, and sustainable improvements are gained in skills to detect and manage anxiety and other psychosocial needs of patients.

This research demonstrated RTs are able to detect and manage anxiety using vignettes, however the ability to do so in a clinical setting given pressures of the environment is yet to be tested. It is possible when faced with real patients, tight schedules, and the presence of multidisciplinary HCPs, the relevant skills are not applied as well as this research suggests. This could be further explored through qualitative research including interviews and observations of RT staff interacting with patients.

Other areas for ongoing research and evaluation as discussed throughout the thesis include: quantifying an effective amount of daily 'talk time' to be incorporated into patient appointments to support RT-patient relationship building, reduce patient anxiety, and improve psychosocial care; assessing the implementation of psychosocial care guidelines and clinical pathways in radiation oncology departments by assessing staff knowledge; investigating if RT facilitated introductions to psycho-oncology services/personnel overcome stigma and increase uptake of psychosocial services; and in-depth qualitative research to explore the impacts on RTs of managing patients with anxiety and other psychosocial concerns.

#### **5.10. Conclusion**

To improve the skills and confidence of RTs in detecting and managing patients experiencing anxiety, multiple strategies discussed in this thesis should be further explored. Skill development in communication, emotional and psychosocial care should be mandatory and

frequently updated. This would enhance RT ability to meet professional standards of practice, improve quality of patient care, and improve inter-professional communication and collaboration. Support from professional associations and organisations to upskill RTs will help shape a culture that values both technical and non-technical skills and help to overcome barriers to accessing training in non-technical skills. The future workforce must be skilled through undergraduate programs incorporating mandatory training in communication skills and emotional/psychosocial care, including theoretical and practical components.

Increased skills and confidence of RTs in detecting and managing anxiety and psychosocial needs will contribute to enhanced patient care. Through effective, timely and collaborative management, multidisciplinary teams will be able to reduce the number of oncology patients with unmet psychosocial needs and reduce the impact of these needs.

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**APPENDIX 1. Publication - “Reduced patient anxiety as a result of radiation therapist-led psychosocial support: a systematic review”**

## REVIEW ARTICLE

**Reduced patient anxiety as a result of radiation therapist-led psychosocial support: a systematic review**

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**Keywords**

Communication, patient anxiety, patient care, psychosocial care, radiation therapist, systematic review

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**Funding Information**

No funding was received for this study.

Received: 20 June 2016; Revised: 10

November 2016; Accepted: 17 November 2016

*J Med Radiat Sci* xx (2017) xxx–xxx

doi: 10.1002/jmrs.208

**Abstract**

Up to 49% of patients attending radiation therapy appointments may experience anxiety and distress. Anxiety is heightened during the first few visits to radiation oncology. Radiation therapists (RT) are the only health professionals in direct daily contact with patients during treatment, placing them in a unique position to explore patients' psychosocial needs. This review aims to synthesise literature regarding the effect of RT-led psychosocial support on patient anxiety. In May 2015, we searched the following electronic databases: Medline, PsycINFO, Embase, CINAHL, PubMed and Cochrane library. Radiation therapy-specific journals were hand-searched, and reference lists of identified studies searched. This review complies with Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. The search identified 263 articles, of which 251 were excluded based on non-English language, duplicate article or relevance. A total of 12 articles involving 1363 patients were included and categorised into three broad themes: 'Patient Perspectives' 3 articles, 'Patient Information and Education' 5 articles and 'Screening and Needs Assessment' 4 articles. Two publications referred to the same sample and data. Quality ratings were mixed, with one study rated 'high' quality, seven 'moderate' and four 'low'. Methodological weaknesses were identified in relation to workflow, sample size and responder bias. RTs have a role in psychosocial support through increased communication and information sharing, which can benefit both patients and staff. RT-led practices such as relationship building, patient education sessions and screening and needs assessments are feasible and can reduce anxiety.

**Introduction**

It is widely documented that up to 49% of patients attending radiation therapy appointments may experience anxiety and distress.<sup>1,2</sup> Anxiety is heightened during the first few visits to radiation oncology, particularly prior to starting treatment.<sup>2–5</sup> During these visits, patients meet a variety of health care professionals (HCPs), including radiation oncologists (ROs), radiation therapists (RTs) and radiation oncology nurses (RONs). RTs' primary roles are patient care, radiation planning and treatment delivery. Their role incorporates patient education,

including explanation and co-ordination of procedures and appointments, and providing advice regarding personal care during treatment.<sup>6</sup> In fulfilling these roles, RTs need to spend time with patients to ensure their information needs are met and that they are willing to proceed with treatment.<sup>3,7</sup> Consequently, RTs have a role in providing psychosocial support to patients, but this role is not well defined.

RTs are the only HCPs in direct daily contact with patients during treatment, placing them in a unique position to explore patients' psychosocial needs.<sup>1,8</sup> Up to one third of patients treated with radiation therapy have

been identified as having unmet psychosocial needs with respect to information and communication, emotional and spiritual support, management of physical symptoms and involvement of family and friends.<sup>9</sup> These unmet needs can result in refusal to undergo radiation therapy, treatment delays, reduced compliance, low adherence to medical advice, decreased quality of life, decreased satisfaction with services and increased resource use.<sup>5,10</sup> It may be possible to improve the quality of care for patients treated with radiation therapy by addressing their unmet psychosocial needs; however, there have been few studies in this area and no systematic reviews. This systematic review aims to synthesise literature regarding the effect of RT-led psychosocial support on patient anxiety.

### Methods

This review complies with Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines.<sup>11</sup>

#### Search strategy

Qualitative and quantitative studies were identified across electronic databases: Medline, PsycINFO, Embase, CINAHL, PubMed and Cochrane library. The search conducted in May 2015 included the following terms: (radiation therapist, radiotherapist, radiographer or technologist) and (psychosocial, supportive, psychol\*, rapport, relationship, communication, psychoeducation, social support, patient education, patient satisfaction or health communication) and (patient) and (anxiety, depression, stress, distress or coping). Hand-searched journals included *Journal of Medical Radiation Sciences*, *The Radiographer*, *Radiation Therapist* and *Journal of Radiotherapy in Practice*. Reference lists of identified studies were also searched.

#### Screening

Initial search results were checked for duplicates (see Fig. 1). Titles and abstracts were independently screened by authors (K.E., H.M.D.) and studies were excluded according to pre-determined PICO criteria (see Table 1). Discrepancies were resolved by discussion. Remaining studies were subjected to blinded examination of methodology to assess eligibility.

#### Data extraction and analysis

Author, K.E., extracted the following data: type and aim, participants, timing and measurement, intensity and feasibility. PRISMA guidelines were used to identify

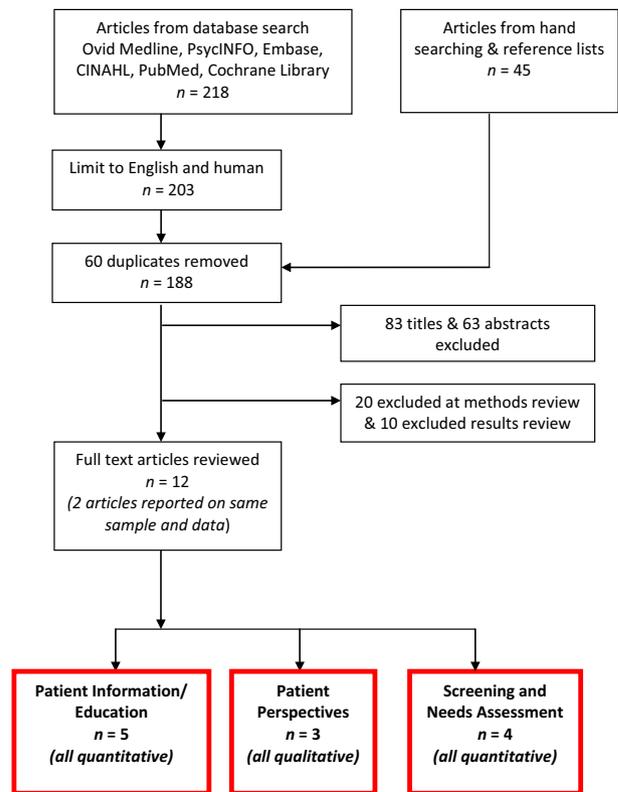


Figure 1. PRISMA flow diagram of search results.

Table 1. PICO definitions of inclusion criteria.

PICO	Inclusion criteria
Population	Radiation therapists or radiation therapy patients receiving external beam treatment
Intervention	Radiation therapist led
Comparison	With or without control group
Outcomes	Patient-related: anxiety, depression, distress, quality of life, self-reported side effects and symptoms, satisfaction, adherence to treatment, unplanned admissions; Radiation therapist-related: perceptions, confidence, communication or feasibility of intervention.
Study type	Any

quality criteria and risk of bias, without knowledge of study results<sup>11</sup> (see Table 2). Subsequently, a quality rating of ‘high’, ‘moderate’ or ‘low’ was assigned. No article was excluded on quality alone, and all authors reached consensus on quality ratings via discussion. Full text copies of potentially relevant articles were obtained, and results and reported outcomes were extracted. A meta-analysis was not feasible, due to the diversity of interventions, measures and outcomes, thus a qualitative synthesis is presented.

## Results

The search identified 263 articles, of which 251 were excluded based on non-English language, duplicate or relevance during title, abstract and methods review (see Fig. 1). In total, 12 articles, involving 1363 patients, were included. Most were conducted at single centres and included patients 18 years or older. The most common reasons for patient exclusion were too unwell, identified cognitive deficits or unable to communicate fluently in the nominated language. The 12 studies were classified into 3 categories according to approach or intervention type: 'Patient Information and Education' 5 studies, 'Patient Perspectives' 3 studies or 'Screening and Needs Assessment' 4 studies. Results of publications using the same sample and data were reported together, this included articles by Clover et al. and Oultram et al.,<sup>4,12</sup> and combining Egestad.<sup>13,14</sup> Quality assessment and summary results are presented below and in Table 3.

### Quality assessment

One study was rated 'high' quality, seven 'moderate' and four 'low'. Methodological weaknesses were identified in relation to workflow, sample size and responder bias.

Workflow and sequencing of interventions and measurements may have impacted results of three studies. In these studies, patient self-report measures were completed not only after the intervention, but also after the patients' first treatment session, consequently, it is impossible to determine the effect of intervention alone on anxiety.<sup>15-17</sup>

Sample sizes were small, with four of eight quantitative studies recruiting 56 patients or less.<sup>15-18</sup> Such samples are insufficiently powered to detect small but meaningful effect sizes. Furthermore, only two studies incorporated control groups to enable assessment of intervention effect.<sup>19,20</sup>

Responder bias may have inflated the effect of group education sessions on anxiety, as session attendance was voluntary and studies did not collect data from non-attendees.<sup>16,18</sup> Canil et al.<sup>16</sup> reported a skewed population including more non-immigrants, higher socioeconomic status and English as a primary language.

### Patient information and education

All studies in this category reported decreased patient anxiety. Two studies reported results of group patient information and education sessions,<sup>16,18</sup> while three studies investigated one-to-one RT-led education/information sessions.<sup>15,17,19</sup> Canil et al.<sup>16</sup> assessed the impact of group sessions ( $n = 24$ ) and detected a

**Table 2.** Quality rating criteria for included studies.

Type	Number	Criteria
Outline of quality rating criteria		
Quant	1	Intervention details: type, aim, timing, measurement, intensity, feasibility
Quant	2	Risk of bias assessed Concealed – Blind or double blind Method of allocation including sequence generation and concealment from recruiters
Quant	3	Control group in study design
Quant	4	Measurement tools validated Validity, reliability addressed Generalisability
Qual	5	Research credible? (data fitting to views of participants) Research dependable/reliable? (logical, traceable, clearly documented) Research confirmable/objective? (analysis grounded in data, researchers bias stated and explored)

First author and year	Study type	Criteria number					Overall quality rating
		1	2	3	4	5	
Included studies rated according to criteria							
Halkett et al <sup>19</sup> (2013)	Quant	H	H	H	H	N/A	H
Dong et al <sup>15</sup> (2014)	Quant	H	N/A	N/A	M	N/A	M
Braeken et al <sup>20</sup> (2011)	Quant	H	M	H	M	N/A	M
Clover et al <sup>4</sup> (2011)	Quant	H	N/A	N/A	M	N/A	M
Oultram et al <sup>12</sup> (2012)	Quant	H	N/A	N/A	M	N/A	M
Halkett et al <sup>17</sup> (2012)	Quant	M	N/A	N/A	M	N/A	M
Mitchell and Symonds <sup>21</sup> (2012)	Quant	M	N/A	N/A	M	N/A	M
Canil et al <sup>16</sup> (2012)	Quant	L	N/A	N/A	L	N/A	L
Miller <sup>18</sup> (2008)	Quant	L	N/A	N/A	L	N/A	L
Halkett and Kristjanson <sup>3</sup> (2007)	Qual	N/A	N/A	N/A	N/A	M	M
Egestad <sup>13</sup> (2013)	Qual	N/A	N/A	N/A	N/A	L	L
Egestad <sup>14</sup> (2013)	Qual	N/A	N/A	N/A	N/A	L	L

H, high; M, moderate; L, low; N/A, not applicable; Quant, quantitative; Qual, qualitative.

significant decrease in anxiety ( $P < 0.001$ ) from baseline to post-intervention. In a cross-sectional study completed after a group session, Miller reported that 47 (94%) patients felt more confident and less anxious.<sup>18</sup> Dong et al.<sup>15</sup> assessed patient centredness of one-to-one pre-treatment sessions ( $n = 56$ ) and reported a post-

consultation decrease in anxiety of 1.2 points. Halkett *et al.*<sup>17</sup> also demonstrated one-to-one psycho-educational interventions reduced anxiety ( $n = 13$ ) from baseline (post-radiation oncologist consultation) to radiation therapy planning and first treatment. In a pilot randomised control trial (RCT) ( $n = 122$ ), Halkett *et al.*<sup>19</sup> showed a greater reduction in anxiety between baseline and post-radiation planning in the intervention group compared to usual care.

Both group and individual education/information sessions are effective in reducing patient anxiety, reducing fear of the unknown and feelings of loneliness. An increase in self-efficacy, knowledge of radiation therapy and preparedness for treatment were also reported.<sup>16–19</sup> However, no direct comparison of individual versus group approach was found in the literature.

### Patient perspectives

Halkett *et al.* and Egestad<sup>3,13,14</sup> reported congruent themes suggesting RT actions and behaviours can reduce patient anxiety. Egestad<sup>13,14</sup> reported reduced anxiety to be associated with effective communication, being treated as an individual, active care, empathy and acknowledgement. Patient anxiety was further reduced by RTs who initiated relationships, spent time with patients and provided information.<sup>13,14</sup> Similarly, Halkett *et al.*<sup>3</sup> reported that patients gained emotional comfort, a sense of belonging and increased confidence in RTs by forming relationships and receiving information. Both authors reported that seeing the same RTs daily reduced anxiety and influenced perceptions of continuity of information and care, accurate treatment delivery, safety and RT competence.<sup>3,13,14</sup> Patients perceived RTs to be competent if they performed their technical duties quickly and confidently, were able to answer questions, recognised and managed side effects and explained unexpected events (e.g. machine breakdowns). Egestad highlighted that adverse side effects can occur, or be poorly managed, due to lack of information sharing and lack of relationship building.<sup>14</sup>

These studies indicate that RT–patient relationships, communication and continuity of care are important aspects of health care that reduce patient anxiety.

### Screening and needs assessment

Results in this category varied. Braeken *et al.*<sup>20</sup> concluded that use of the Screening Inventory of Psychosocial Problems (SIPP) screening tool was feasible, with the majority of patients and RTs agreeing that screening discussions were important and pleasant. ‘Physical’ and ‘emotional’ needs were rated as acceptable to explore with screening, but ‘sexual’ issues were not. In the context of

individual patient screening processes, RTs rated the SIPP highly as an ‘invitation to discuss’ and provide ‘better insight into patients’ psychosocial well-being’. However, global assessment of the usefulness of the SIPP varied across information items and time points. At 7 months post-study commencement, RTs highly rated SIPP as useful to ‘contribute to discussion’, ‘quality of consult’ and ‘contribution to psychosocial discussions’, but these aspects were rated poorly at 13 months.<sup>20</sup> Mitchell and Symonds reported that 43% of RTs rated screening with the ‘distress and emotion thermometers’ as useful. The screening process was found to be most useful when RTs were uncertain of the presence of anxiety or when anxiety was clearly high. Mitchell and Symonds also noted that RT motivation, use of screening and detection of psychosocial issues all increased if RTs rated the screening tool as practical and relevant.<sup>21</sup> Clover *et al.* and Oultram *et al.*<sup>4,12</sup> found slight agreement between anxiety reported by patients compared with RTs. Of those patients self-reporting anxiety, RTs correctly identified 27% of cases of anxiety at radiation planning and 50% of cases at first treatment.

These studies indicate that RT-led ‘screening and needs assessment’ is feasible, improves communication with patients and increases RT knowledge of patient issues.<sup>12,20,21</sup>

### Psychosocial referrals

Braeken *et al.* monitored psychosocial referrals made at one-to-one sessions between the patient and their assigned RT utilising the SIPP. During these sessions, conducted prior to commencing treatment, 33 referrals were recorded. Of patients referred, 31 demonstrated sub-clinical or clinical psychosocial symptoms. Twenty-one referrals were accepted, indicating an appropriate time point to offer psychosocial referrals. During sessions conducted at completion of the treatment course, nine patients, all of whom experienced clinical psychosocial symptoms, were offered and accepted psychosocial referrals.<sup>20</sup>

### Time to deliver screening processes and interventions

Time may be a barrier to implementing new processes. Mitchell and Symonds and Braeken *et al.* reported average RT–patient screening discussion times of 3 and 5.3 min respectively.<sup>20,21</sup> Dong *et al.*<sup>15</sup> recorded a wide range of times, 3.36–16.17 min, in pre-treatment education sessions during which some anxiety is addressed, suggesting variability between sessions. Halkett *et al.*<sup>19</sup> monitored the quality of pre-planning and pre-treatment education consultations, hence these longer

**Table 3.** Summary of included studies.

Author and year	Type	Target cancer diagnosis	Category	No. of patients	No. of RTs	RT training	Results
Halkett et al. <sup>19</sup> (2013)	RCT	Breast	PIE	122	10	2 mandatory workshops: (1) Preparing patients for radiation therapy (2) Eliciting and responding to emotional cues	<ul style="list-style-type: none"> <li>At pre-planning time point, significant results for intervention versus control: anxiety reduced by 0.15 points, knowledge (planning) increased by 3.5 points, knowledge (treatment) increased by 5.3 points, radiation therapy-related concerns reduced by 0.9 points.</li> </ul>
Dong et al. <sup>15</sup> (2014)	Cross-sectional	Mixed	PIE	56	10	N/A	<ul style="list-style-type: none"> <li>RTs scored high on 'MPCC information' (explaining radiation therapy procedures, skin care, side effects)</li> <li>RTs scored low on 'MPCC feelings' (inquiring about patient feelings/fears/anxieties, understanding of radiation therapy)</li> <li>Post-consultation decrease in STAI scores (range): baseline 10.98 (6–24), post-consultation 9.6 (6–17)</li> </ul>
Braeken et al. <sup>20</sup> (2011)	RCT	Mixed	SNA	568	7	1-h session – use and interpretation of SIPP conducted by the researcher and 2 social workers	<ul style="list-style-type: none"> <li>SIPP feasible and valued by most patients and some RTs</li> <li>Patient perspectives: 67.5% agreed discussing SIPP with RTs was important; 47.4% rated discussions as pleasant; usefulness of discussing physical, psychosocial and sexual issues with RTs were 56%, 39.3% and 9.3% respectively.</li> <li>RT 7-month versus 13-month FU SIPP usefulness for 'quality of consult' – 33.3%, 16.7% and 50.1% versus 66.7%, 0%, 33.3% negative, moderate and positive respectively</li> <li>RTs were negative towards changing communication styles, SIPP usefulness in referring patients to psychosocial care and feasibility of discussing psychosocial issues</li> <li>RTs reported increased patient communication and knowledge of patient issues through screening processes</li> <li>RT motivation positively correlated with 'usefulness' of screening processes</li> </ul>
Clover et al. <sup>4</sup> (2011) and Oultram et al. <sup>12</sup> (2012)	Cohort	Head & neck or Brain	SNA	105	35	N/A	<ul style="list-style-type: none"> <li>At CT-Sim: RTs identified 27% of patient self-reported cases of anxiety and 90% of non-anxious cases, provided verbal reassurance alone to three patients and three patients had their mask removed</li> </ul>

(Continued)

Table 3. Continued.

Author and year	Type	Target cancer diagnosis	Category	No. of patients	No. of RTs	RT training	Results
Halkett et al. <sup>17</sup> (2012)	Pre-post feasibility	Breast	PIE	13	4	2 mandatory workshops: (1) Preparing patients for radiotherapy (2) Eliciting and responding to emotional cues	<ul style="list-style-type: none"> <li>At Fraction 1: RTs identified 50% of patient self-reported cases of anxiety and 57% of non-anxious cases; provided verbal reassurance alone to three patients, three patients had their mask removed (one refused further treatment), one patient received verbal reassurance and mask removal (two of these patients were unable to complete treatment that day).</li> <li>Authors concluded that patients may have under-rated anxiety, while RTs may have over-rated anxiety</li> <li>HADS scores decreased from baseline to T1 and T2: Baseline mean = 13.6 (SD = 8.03, range = 2–22); T1 mean = 6.4 (SD = 4.9, range = 2–19); T2 mean = 7.0 (SD = 7.5, range = 0–20)</li> <li>Mean scores for ‘concerns about radiotherapy’ dropped from baseline T1, mean = 4.4 (SD = 2.45), to T2 (post-planning intervention), mean = 2.50 (SD = 1.64) respectively</li> <li>‘Knowledge of radiotherapy’ scores increased from T1 to T2 and T3</li> <li>Patients reported the intervention was beneficial in preparing for treatment</li> <li>RTs were positive about delivering intervention and the perceived benefit to patients</li> <li>The intervention was feasible and acceptable</li> <li>Time, staffing and space were identified as barriers in delivering intervention. Time and staffing issues were remedied</li> </ul>
Mitchell and Symonds <sup>21</sup> (2012)	Cohort	Mixed	SNA	379	30	Optional 1-h session in use of screening tool. Communications training also available. Less than 25% of clinicians attended	<ul style="list-style-type: none"> <li>RTs report screening ‘useful’, ‘not useful’ or ‘unsure’ in 43%, 21.5% and 35.4% of assessments respectively</li> <li>Significant positive correlation between RTs rating screening as ‘useful’ and rating any of the following: the ‘screening tool as practical’, the ‘RT having low confidence’ or ‘assessing a patient with high anxiety’</li> <li>Favourable perception of screening was significantly correlated with both completion of screening tool</li> </ul>

(Continued)

Table 3. Continued.

Author and year	Type	Target cancer diagnosis	Category	No. of patients	No. of RTs	RT training	Results
Canil et al. <sup>16</sup> (2012)	Cross-sectional	Mixed	PIE	24	N/A	N/A	<p>training and improved detection of psychological issues</p> <ul style="list-style-type: none"> <li>• RTs reported increased patient communication and knowledge of patient psychological issues using screening</li> <li>• Anxiety STAI-S pre- and post-test median scores were 2.00 and 1.46 respectively (<math>P &lt; 0.001</math>). No change = 1 patient, increased anxiety = 3 patients</li> <li>• Self-efficacy CBI-B pre- and post-test median scores were 6.96 and 7.82 respectively (<math>P &lt; 0.001</math>). No change = 3 patients</li> <li>• 16 of 23 attendees reported reduced concerns</li> <li>• Many reported reduced feelings of isolation</li> </ul>
Miller. <sup>18</sup> (2008)	Cross-sectional	Mixed	PIE	50	N/A	N/A	<ul style="list-style-type: none"> <li>• Post-intervention, patients reported: feeling more confident and less anxious about treatment; meeting other patients helped decrease feelings of isolation; reassurance was gained through staff openness and friendliness</li> <li>• Components rated most valuable were demonstration of the treatment machine 66% and informal one-on-one chat 34% with RT staff</li> </ul>
Halkett and Kristjansson <sup>3</sup> (2007)	Qualitative interview	Breast	PP	34	N/A	N/A	<ul style="list-style-type: none"> <li>• Patients perceive RTs as not only technical professionals but also information and supportive care givers</li> <li>• Main theme: the importance of the patient achieving emotional comfort</li> <li>• Emotional comfort is achieved by forming relationships with RTs and gaining information.</li> <li>• Achieving emotional comfort can decrease anxiety and enables the patient to feel more relaxed, a sense of belonging and confident in the treatment and RTs skills</li> <li>• Developing a relationship with the same RTs daily was perceived to reduce anxiety, improve continuity of information and treatment accuracy</li> </ul>

(Continued)

**Table 3.** Continued.

Author and year	Type	Target cancer diagnosis	Category	No. of patients	No. of RTs	RT training	Results
Egestad <sup>13,14</sup> (2013)	Qualitative interview	Head & neck	PP	12	N/A	N/A	<ul style="list-style-type: none"> <li>• Main themes: emotional vulnerability, need to be treated as a unique person</li> <li>• Sub-themes: to be understood, emotional support, to feel safe, to form relationships, politeness and communication</li> <li>• Patients valued effective communication, being treated as an individual, care/empathy and acknowledgement</li> <li>• RTs who initiated relationships, spent time with patients and provided information helped decrease patient vulnerability, anxiety and loneliness</li> <li>• Familiar RTs who provide information and build a relationship with the patient can reduce patients' loneliness, existential anxiety and uncertainty</li> <li>• Perceived RT incompetence can increase patient insecurities and anxiety</li> </ul>

N/A, not applicable; NK, not known; SNA, screening and needs assessment; PIE, patient information/education; PP, patient perspectives; MPCC, measure of patient centre communication; STAI, State-Trait Anxiety Inventory; ASR, authentic self-representation; SIPP, Screening Inventory of Psychosocial Problems; FU, follow-up; CT-Sim, computed tomography simulation.

session times (mean = 24.9 min) may be more representative of time required to deliver a meaningful intervention.

### RT training

Four of 10 studies provided training to RTs prior to study commencement. Mitchell and Symonds and Braeken *et al.*<sup>20,21</sup> provided 1 h training sessions specific to the use of screening tools being tested and recognition of emotional issues. Halkett *et al.*<sup>17,19</sup> provided mandatory training consisting of two 4-h workshops for RTs delivering the intervention. Mitchell and Symonds reported that less than 25% of participants completed training and speculated that lack of protected time to attend training was a contributing factor.<sup>21</sup> Both Mitchell and Symonds and Braeken *et al.*<sup>20,21</sup> concluded that their results may have been negatively impacted by insufficient training and recommended further communication skills training (CST). Halkett *et al.*'s RT training workshops focused on content and delivery of radiation therapy-specific information to patients and CST, specifically 'eliciting and responding to emotional cues'. Real-time feedback, ongoing mentoring and support were provided to RTs during study intervention delivery.<sup>17,19</sup> Oultram *et al.* and Dong *et al.*<sup>12,15</sup> also recommended CST to improve detection and management of patient issues including anxiety, claustrophobia, coping and side effects. Clover *et al.* and Oultram *et al.*<sup>4,12</sup> reported that RTs over-estimated anxiety compared to patient self-report, and suggested training may improve accurate detection.

### Implementation recommendations

'Information/education' and 'screening and needs assessment' interventions are feasible and improve patient outcomes.<sup>15–20</sup> However, they must be implemented strategically due to perceived negative impact on staffing requirements, appointment schedules and resources, for example private rooms.<sup>5,21</sup> Mitchell and Symonds recommended engaging motivated and non-motivated RTs in the development process, providing training, ongoing support/mentoring and meaningful feedback and developing clear action plans.<sup>21</sup> Implications are that management and frontline RTs work together to provide infrastructure to enable interventions and overcome identified barriers to achieve improved patient care and outcomes, specifically reduced anxiety.

### Discussion

This systematic review identified a small number of publications focused on RT-led psychosocial practices

including detection, assessment or management of patient anxiety. All recognised the need to address psychosocial issues and indicate that RTs can positively impact on patient experiences of radiation therapy. Specifically, RT–patient interactions can reduce patient anxiety through effective communication, forming relationships, acknowledging patients as individuals and provision of education/information. Patient anxiety could be further reduced by exploring the RT role, application of screening and needs assessments and training in both communication skills and detection and management of emotional distress.

The increasing prevalence and burden of emotional morbidity related to cancer diagnoses and survival are widely recognised. This has resulted in the development of 'Clinical Practice Guidelines for the Psychosocial Care of Adults With Cancer', which provide awareness and practical information to HCPs to improve the management of psychosocial issues for patients and carers.<sup>22</sup> Turner *et al.*<sup>23</sup> highlighted that most HCPs have minimal training and knowledge in this area. In fact, it has been reported that RTs are not confident discussing psychosocial issues.<sup>24</sup> However, all HCPs working with cancer patients need to adhere to these guidelines in clinical practice to enable early detection of psychosocial issues, empathetic management and effective referrals to specialised care.<sup>23</sup>

Radiation therapy provokes high anxiety, with patients reporting fear of radiation and that being in an oncology department reminds them of their life-threatening condition.<sup>13,14,18</sup> RTs prepare patients for the procedure through education and information before the start of treatment. Adequate preparation has been shown to reduce patient anxiety as well as reduce recovery time and complication rates in aversive and invasive medical procedures.<sup>25</sup> Furthermore, RTs interact with patients daily, and throughout treatment are able to tailor information to suit individual patient's changing needs and to involve patient's in their own care, for example, by encouraging them to ask questions.<sup>23,26</sup> The RT–patient rapport also enables RTs to consider whether to involve families and carers in education/information sessions which may improve the overall patient experience and potentially reduce patient and family anxiety.<sup>5</sup> In summation, the RT–patient relationship is unique and valued by RTs and patients.

Confusion regarding the 'radiation therapist' role may contribute to a lack of patient satisfaction, information provision and psychosocial support. The role is defined by RTs and patients as encompassing technical, information and supportive care components.<sup>6</sup> While the RT role will vary across departments, clear definitions and expectations could focus RT interactions and

increase patient satisfaction, while ensuring patient needs are met. Braeken *et al.* reported that RTs were less positive about asking questions regarding patient psychosocial well-being and patients reported that psychosocial and sexual issues were not discussed.<sup>20</sup> Similarly, Dong *et al.* reported that in one-to-one education sessions RTs scored poorly when exploring patients' feelings, fears and anxiety and understanding of radiation therapy. Interestingly, Dong *et al.* showed a significant positive correlation between patient-centred communication and authentic self-representation; thus, when more interest was shown, the patients represented themselves more honestly, expressed concerns and asked questions.<sup>15</sup> This is important in the context presented by Egestad, where four of five masked head and neck patients with claustrophobia 'forced themselves' through radiation sessions without disclosing their fears.<sup>13,14</sup> It is possible, that RTs do not ask about patient psychosocial issues as they do not believe it is their role, know how to elicit information or manage concerns. This was raised by oncologists, surgeons and nurses who worried that screening a patient for psychosocial issues is not advantageous if the HCP is then unable to manage the issues disclosed due to lack of time, training, referral pathways and specialised services.<sup>27</sup>

RT training in the areas of communication skills (CST) and emotional well-being could enhance the patient experience.<sup>3,7,12,15,20,21,28</sup> Psychosocial care guidelines state that HCPs need an understanding of common conditions, such as anxiety and depression, and an awareness of effective treatments to enable detection and discussion of such issues with patients.<sup>23</sup> This is supported by Mitchell and Symonds who reported RTs and chemotherapy nurses trained in use of screening tools were more satisfied with screening processes and more motivated to screen patients, discuss issues and educate patients.<sup>21</sup> Braeken *et al.*, who reported low training compliance, stated RTs did not rate psychosocial discussions as important, and RTs did not change communication styles when using the SIPP, a tool designed to explore psychosocial issues.<sup>20</sup> Fallowfield *et al.* support these observations stating that professional experience alone does not resolve poor practitioner–patient communication, but CST can improve skills. In a study of 160 oncologists, those who completed CST showed significantly greater expressions of empathy, use of focused questions and appropriate responses to patient cues in consultations after training. Oncologists reported the training to be interesting and highly relevant to clinical practice.<sup>10</sup> Similarly, in a study by Halkett *et al.*, 60 RTs who participated in two communication skill workshops rated strong satisfaction with all aspects of the training including relevance to daily practice, increased

confidence and acquisition of new skills. However, to ensure effective learning, small group sessions with opportunities to practice skills and receive feedback are essential.<sup>5</sup> Furthermore, to ensure translation of learned skills into the clinical environment, clinical supervision/mentoring and feedback are recommended.<sup>27,29</sup> Training in emotional distress and CST, including ongoing support for RTs, could lead to improved patient-centred care, recognition and management of patient issues and use of screening processes.

The value of the RT–patient relationship may be enhanced by using screening and assessment tools. Evidence suggests that screening tools are more successful in detecting psychosocial issues than relying on clinical judgement alone.<sup>27</sup> Screening tools may facilitate triaging by RTs which could reduce burden on limited psycho-oncology resources and provide timely patient support.<sup>4,27</sup> Clover *et al.*<sup>4</sup> proposed a two-tiered screening and intervention system, with RTs screening for anxiety and managing patients exhibiting low anxiety through skilled communication. Patients with moderate to high anxiety or psychological issues would be referred for specialised care. Turner has actioned this innovation in 'PROMPT', a RCT with a three-tiered system.<sup>29,30</sup> Additionally, referral pathways must be clear and accessible to RTs,<sup>7</sup> as various patient-reported needs, including physical, sexual, financial and spiritual, may be better provided by multidisciplinary team members such as the radiation oncologist, nurse, social worker, counsellor, nutritionist or other.

This systematic review has some limitations. A systematic process was followed to identify relevant publications; however, it is possible that articles may have been missed or were published after the search was conducted. Researcher bias is a conceivable limitation, although this was minimised by involvement of and discussions among all authors.

## Conclusion

Evidence suggests that RTs have a role in psychosocial support through increased communication and information sharing that can benefit both patients and RTs. RT-led practices such as education and information sessions, screening and needs assessments and relationship building are feasible and promising as moderators of anxiety and warrant further investigation using more rigorous evaluation methods. Future research in radiation therapy service provision and reducing patient anxiety should focus on RT role definition, RT training in communication skills and detection and management of anxiety, referral pathways to psychosocial services and implementation of these processes into clinical practice.

## Conflict of Interest

The authors declare no conflict of interest.

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**APPENDIX 2. Publication – “Development and pilot of an international survey:  
‘Radiation Therapists and Psychosocial Support’”**

## Development and pilot of an international survey: 'Radiation Therapists and Psychosocial Support'

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### Keywords

Patient anxiety, pilot survey, psychosocial support, radiation therapists, survey development

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Received: 15 June 2017; Revised: 17 April 2018; Accepted: 9 May 2018

*J Med Radiat Sci* **65** (2018) 209–217

doi: 10.1002/jmrs.286

### Abstract

**Introduction:** Up to one third of radiation therapy patients are reported to have unmet psychosocial needs. Radiation therapists (RTs) have daily contact with patients and can provide daily psychosocial support to reduce patient anxiety, fear and loneliness. However, RTs vary in their values, skills, training, knowledge and involvement in providing psychosocial support. The aims of this study were to: (1) develop an online survey instrument to explore RT values, skills, training and knowledge regarding patient anxiety and psychosocial support, and (2) pilot the instrument with RT professionals to assess content validity, functionality and length. **Method:** An online cross-sectional survey, titled 'Radiation therapists and psychosocial support' was developed. Items included patient vignettes, embedded items from RT research, and the Professional Quality of Life Scale (ProQOL5). Four radiation oncology departments volunteered to pilot the survey; each nominated four RT staff to participate. Survey data were analysed descriptively and qualitative feedback grouped and coded to determine whether the survey needed to be refined. **Results:** Thirteen of sixteen RTs completed the pilot survey and feedback form. Median time to completion was 35 mins, with 54% of respondents stating this was too long. Respondents reported content, questions and response options were relevant and appropriate. Feedback was used to: refine the survey instrument, minimise responder burden and drop out and improve functionality and quality of data collection. **Conclusion:** This pilot of the 'Radiation therapists and psychosocial support' survey instrument demonstrated content validity and usability. The main survey will be circulated to a representative sample of RTs for completion.

### Introduction

People diagnosed with cancer are likely to experience some psychosocial distress across their cancer trajectory including emotional, social, spiritual and psychological concerns<sup>1</sup>. Both Australian and international statistics reflect the significant issue of psychosocial concerns affecting cancer patients. In Australia, up to 66% of people with cancer experience long-term psychological distress, and clinically significant anxiety and depression rates have been reported to be 30% and 20–35% respectively<sup>2</sup>. Furthermore, 75% of cancer patients with

clinically relevant anxiety and/or depression did not receive counselling or psychological treatment.<sup>3</sup> These high levels of psychosocial distress and unmet needs in people with cancer have been recognised globally, and have led to the development of psychosocial care guidelines for clinicians in Australia, Canada, United States of America and Europe.<sup>1,2,4–7</sup> These guidelines state that psychosocial care involves all health care professionals (HCP) in cancer care,<sup>2</sup> however, no clear evidence exists demonstrating the implementation of these guidelines by radiation therapists (RTs) into routine practice.

It was estimated that 134,174 Australians would be diagnosed with cancer in 2017<sup>8</sup> and approximately half could benefit from radiation therapy.<sup>9</sup> In research conducted in a radiation oncology environment, Mackenzie et al. found that up to 31% of radiation therapy patients reported their care and well-being could have been improved across two or more patient-centred care domains of psychosocial care. The most frequently reported categories were: information and communication; emotional and spiritual support; management of physical symptoms; and involvement of friends and family.<sup>10</sup> Possible reasons for this include lack of multidisciplinary teams, sub-optimal co-ordination of care, lack of/overburdened services, and/or lack of professional knowledge in psychosocial care domains.

RTs are members of the multidisciplinary oncology team responsible for radiation therapy treatment planning and delivery. RT roles include technical and patient care such as communication regarding procedures and technical aspects of treatment, hygiene and self-care during treatment and appointment scheduling.<sup>11</sup> As the only members of the radiation oncology team engaging daily with patients throughout their radiation treatment, RTs are uniquely positioned to provide psychosocial support such as patient education and information, or referral to psychosocial services. RTs are motivated to deliver this support according to Hulley who reported 85% of RTs surveyed entered the profession to provide care and emotional support to patients.<sup>12</sup> Furthermore, Bolderston identified altruism and a desire to help people with cancer, as a common motivator to become an RT.<sup>11</sup> Despite this high level of motivation, RTs are reported to lack confidence and feel inadequately trained or prepared to discuss psychosocial issues.<sup>11,13–15</sup>

Trained professionals with expertise in providing psychosocial care include psychologists, psychiatrists, social workers, counsellors and pastoral carers. We are not proposing RTs fulfil the role of these professionals; rather, RTs are part of the multidisciplinary team who share the responsibility of facilitating holistic care, including psychosocial support. The extent of RT involvement in psychosocial care will vary based on knowledge, confidence, experience, professional networks and local services available and importantly patient needs.

Most research investigating psychosocial support for cancer patients has not included RTs.<sup>16,17</sup> We conducted a systematic review focused on RT led psychosocial support and its impact on patient anxiety. Of 12 publications identified, three were specific to *'Patient Perspectives'* (qualitative), five to *'Patient Information/Education'* and four to *'Screening and Needs Assessment'*. The review indicated RTs do provide daily supportive care that can reduce anxiety, fear and loneliness. To

achieve this, RTs build rapport with patients and provide emotional comfort, information and education.<sup>18</sup> RT use of screening and needs assessment tools was shown to be feasible and resulted in increased communication and knowledge of patients' psychosocial concerns.<sup>17,19–21</sup> RT motivation to use screening tools varied, but training appeared to increase RT co-operation.<sup>18</sup>

Our review summarised current knowledge of RT-led provision of psychosocial care and identified gaps in the literature.<sup>18</sup> Four areas requiring further investigation were recognised: RT role clarification; availability and uptake of communication skills training; knowledge of psychosocial referral pathways; and RT involvement in screening and needs assessments.<sup>18</sup> Consequently, we proposed to conduct an online survey exploring RT perceptions of, and experience in, identifying and managing psychosocial distress. The aims of this paper were to report:

- 1 the development of an online survey instrument 'Radiation Therapists and Psychosocial Support Survey'; and
- 2 the pilot of this instrument with RT professionals – assessing content validity, functionality and length

## Methods

### Survey development

A multidisciplinary research team was formed, including one radiation oncologist, two radiation therapists and one behavioural scientist. An online survey was designed using Qualtrics survey software. Use of an online data collection strategy was selected as it is inexpensive, wide reaching and facilitates complete and accurate data collection.<sup>22</sup> Survey construction was influenced by published guidelines and tailored to an RT population.<sup>22–24</sup>

### Ethics

Ethics approval was granted by the University of Sydney Human Research Ethics Committee (project number 2016/227).

### Survey items

The 'Radiation Therapists and Psychosocial Support Survey' instrument comprised 147 items grouped into 11 sections (Table 1). This included items and patient vignettes developed for this study, as well as existing questionnaires. All items were reviewed by the research team to ensure study objectives were met. Items were designed to include qualitative and quantitative

**Table 1.** Development of the 'Radiation Therapists and Psychosocial Support' survey with reference to existing literature and evidence gaps.

Survey section	Existing literature	Evidence gaps in existing literature
3. Communication Skills Training (CST) (Pre test)	<ul style="list-style-type: none"> <li>• Girgis assessed perceived need for CST in other oncology professionals but did not include RTs<sup>36</sup></li> <li>• Larsen conducted a single centre Canadian study indicated RTs were interested in further education in communication<sup>15</sup></li> <li>• Turner identified a lack of CST in HCP groups<sup>4</sup></li> <li>• Review of CST for HCPs did not identify any studies exploring CST in RTs<sup>16</sup></li> <li>• Diggins <i>et al.</i> identified Victorian RTs who had completed CST<sup>25</sup></li> <li>• Lavergne concluded 87% of RTs would like further education in management of anxiety and depression<sup>33</sup></li> </ul>	<ul style="list-style-type: none"> <li>• RTs perceived need and motivation to undertake CST</li> <li>• RT perceptions and relevance of CST to their role</li> <li>• Potential barriers to partaking in CST</li> <li>• What training RTs undertake in the area of psychosocial care and communications skills as very limited information exists in current literature.</li> <li>• RTs perceived value of such training.</li> </ul>
4. Values	<ul style="list-style-type: none"> <li>• Hulley assessed perceived value of RTs providing support to emotional patients as part of the RT role<sup>12</sup></li> <li>• Professional associations and guidelines outline expectations of cancer HCPs, including RTs, to support patients<sup>15</sup></li> <li>• Bolderston reported RTs technical skills appear more highly valued in the workplace than caring skills<sup>11</sup></li> <li>• Multiple authors suggest lack of clarity regarding the perceived role of the RT<sup>20</sup></li> <li>• Diggins suggests RT perception of their role impacts burnout<sup>25</sup></li> <li>• Egestad reported patients are receptive to RTs providing psychosocial care<sup>37</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Do RTs value their role in providing supportive care to patients and is this valued by colleagues, management and organisations</li> </ul>
5. Patient Anxiety	<ul style="list-style-type: none"> <li>• Multiple authors have reported RTs are motivated to provide psychosocial support<sup>11–13</sup> but lack confidence<sup>13,14</sup></li> <li>• Multiple authors have reported RTs are more comfortable recognising and managing anxiety than depression<sup>33</sup></li> <li>• Diggins suggested a relationship between confidence in providing psychosocial support and RT burnout<sup>25</sup></li> <li>• Oultram reported RTs over estimated patient anxiety and suggested further training was necessary<sup>17</sup></li> <li>• Halkett reported 95% of RTs surveyed felt distressed patients require more time for their planning appointment than non-distressed patients<sup>13</sup></li> <li>• Lavergne reported personal experience with anxiety and depression has a positive impact on comfort when dealing with patients with anxiety and depression<sup>33</sup></li> </ul>	<ul style="list-style-type: none"> <li>• RTs knowledge of signs and symptoms of anxiety</li> <li>• RTs confidence in dealing with anxiety</li> <li>• RTs perception of the impact of patient anxiety on the work environment including self, colleagues, appointment scheduling, safety and accuracy of treatment delivery</li> <li>• The impact of personal experiences on confidence and knowledge of anxiety, on managing a patient with anxiety</li> </ul>
6. Vignettes	<ul style="list-style-type: none"> <li>• Halkett studied video recording of RTs, nurses and two patient interactions attending radiation planning sessions. To assist anxious patients, RTs and nurses used strategies to: explore patients feelings, dedicate more time to patient,</li> </ul>	<ul style="list-style-type: none"> <li>• RTs abilities to detect and manage patients with anxiety</li> </ul>

*(Continued)*

**Table 1.** Continued.

Survey section	Existing literature	Evidence gaps in existing literature
	acknowledge/validate/reassure patient, refer patient to other professionals, provide other sources of information to patient <sup>13</sup>	
7. Current Work Practices	<ul style="list-style-type: none"> <li>Multiple authors concur screening for distress is more effective than relying on clinical judgement alone<sup>5</sup></li> <li>Braeken and Mitchell independently concluded RTs are not in agreement that screening is effective<sup>19,20</sup></li> <li>Maamoun audited radiation therapy treatment records and did not find any referrals to psychosocial care services annotated by RTs<sup>14</sup></li> <li>Larsen reported a median rate of referral to nurse, nutritionist, social worker or other for psychosocial care was 25% compared to literature estimate of 30-39% in a single centre study<sup>15</sup></li> <li>Lavergne reported 78% of RTs agreed screening is important while only 16% report checking screening results weekly. Also, 70% of RTs refer to social workers as a first line of action for distressed patients, suggesting RTs are unaware of other services or how to gauge the most appropriate action<sup>33</sup></li> <li>Hulley reported 94% of RTs were aware of psychosocial services and how to access these for patients, 70% had access to patient educational resources regarding psychosocial care, and 45% were aware of resources to improve their own ability to deliver psychosocial care<sup>12</sup></li> </ul>	<ul style="list-style-type: none"> <li>RTs awareness of departmental screening processes and psychosocial resources.</li> <li>RTs involvement in psychosocial screening processes and referral pathways, including initiating referrals</li> </ul>
8. Current Work Resources	<ul style="list-style-type: none"> <li>Multiple authors have identified or suggested barriers to providing psychosocial care. These include: time, space, staffing, knowledge, training, informational resources, organisational culture<sup>12,15</sup></li> <li>Maamoun found RTs with more than ten years experience placed significantly higher importance on identifying supportive care needs of patients than RTs with less experience<sup>14</sup></li> </ul>	<ul style="list-style-type: none"> <li>Perceived barriers to providing psychosocial support in a larger sample size</li> </ul>
10. Work Related Stress	<ul style="list-style-type: none"> <li>Larsen<sup>15</sup> report RT involvement in psychosocial care increases job satisfaction and personal accomplishment</li> <li>Diggins<sup>25</sup> concluded dealing with emotional patients has an unclear impact on depersonalisation and emotional exhaustion</li> <li>Multiple authors report organisational and workload factors are strongly related to workplace stress<sup>7,30,32,34</sup></li> </ul>	<ul style="list-style-type: none"> <li>RTs use of support services for own health</li> <li>Extent of burnout in RTs and associations with other factors (e.g. hours of direct patient care)</li> </ul>

Other survey instrument sections not detailed above were: Section 1 – Participant Information Statement including instructions, ethics and consent; Section 2 – Demographics – Individuals and place of employment; Section 9 – Communication Skills Training (post-test); Section 11 – Additional Information including free text comments, and requests to receive CPD points, study results and/or to be notified of future research.

response options and careful consideration was given to:

• question and response types

- question and response clarity
- logical grouping and order of topics/questions
- maintaining anonymity and confidentiality

- ensuring sensitivity when asking demographic questions; and
- format/layout

### New items

New items were developed to explore the following knowledge gaps (Table 1): RT role definition (section 3); RT communication skills/training (section 3); RT skill in identifying emotional distress (section 6) and use of screening and needs assessment tools (section 7). RT communication skills have been associated with RT confidence and burnout, therefore items were developed to explore this relationship (section 10).<sup>14,25</sup>

### Patient vignettes

To assess RT ability to detect and manage patient anxiety, three vignettes based on common presentations of radiation therapy patients with psychosocial needs were developed. Using structured vignettes is an informative approach to assessing skills, and examining factors that influence respondents.<sup>26</sup> Guided by previous research, the vignettes describe three fictitious patients in a radiation therapy setting, with non-gender-specific names and diagnoses to minimise potential gender biases.<sup>26,27</sup> The vignettes depicted patients with varying levels of anxiety and were followed by these four questions (Table 1, section 6): select appropriate descriptors for each patient, list key indicators leading to the selection of these descriptors, list appropriate management for each case, and indicate appropriateness of psychosocial referral.

### Existing items and instruments

Permission was obtained to embed the Professional Quality of Life Scale (ProQOL5) and items designed by Hulley in research regarding RT interactions with emotional patients.

ProQOL5 is a freely available instrument assessing burnout in 'helping professions'. It has been widely used in healthcare groups and demonstrated good construct validity. It consists of 30 items, in three sub-sections, and uses a five-point Likert response scale. It generates three scores: (i) compassion satisfaction; (ii) compassion fatigue burn out; and, (iii) compassion fatigue secondary traumatic stress. The reported reliability and validity value for the compassion satisfaction and burnout scales are  $\alpha = 0.88$  ( $n = 1130$ ); and  $\alpha = 0.75$  ( $n = 976$ ) respectively.<sup>28</sup>

Twenty-six items designed by Hulley, explored the perceived value of RT interactions with emotional

patients, and the perceived availability of resources in the work environment to enable RTs to support emotional patients (Table 1, sections 4 and 8).<sup>12</sup>

### Pilot survey and pilot feedback form

Radiation therapy departments volunteered to participate in the pilot, following a presentation (by the first author) at the New South Wales Radiation Therapy Research Showcase. A representative in each department was asked to invite four RTs to assess survey feasibility by completing the online survey and pilot feedback form. Guidelines suggested that invited RTs include a range of: sex, age, experience, interest in patient care and clinical/non-clinical responsibilities. An email invitation, survey link and feedback form was forwarded to RTs. The participant information statement was available to participants prior to commencing the survey and outlined the following: the purpose of the study, participation is voluntary, ethics approval details and contacts, consent was implied by survey submission, and contact details for two of the researchers. The feedback form consisted of 12 open-ended questions to encourage qualitative feedback regarding survey content validity, clarity, internal consistency, appropriateness, intent, length and flow.<sup>29</sup> The pilot survey and feedback form can be found in Data S1–S2 or requested from the corresponding author.

### Pilot process

Three distinct groups, with expertise in medical radiation sciences, medicine, and/or psychology, assessed content validity, clarity of items and item groupings. These groups offered differing perspectives on the relationship of items to the conceptual domain of the survey, which led to survey refinement.

The first group, pilot respondents, completed the survey and the pilot feedback form. The second group consisted of professional association representatives and academics who provided written feedback regarding content validity and survey relevance to international RTs. Thirdly, the research team formed the panel of experts to finalise survey content, based on feedback from groups 1 and 2.<sup>29</sup>

### Results

Invitations to participate in the pilot were sent to 16 RTs in four radiation therapy departments. These departments included a mix of urban, outer metropolitan, public and private organisations. Thirteen RTs (81% response rate) completed the pilot survey (online) and feedback form (via email). Twelve participants responded within two

weeks of the email invitation. A reminder was sent two weeks post-initial invitation, generating receipt of one further survey and feedback form. Of note, one feedback form was returned incomplete (Table 2). The 81% response rate demonstrated acceptability of the survey concept by the target group. Demographics collected, showed a range of personal and work place characteristics (Table 3). No data were collected from the three non-responders.

Responses to feedback questions were compiled into four thematic groups: (i) time/survey length; (ii) content; (iii) functionality and (iv) other. The responses were discussed by the research team and consensus reached regarding how to amend the survey instrument (Table 4).

#### *i) Time/Survey Length*

Seven of 13 respondents reported time to complete the survey was too long (median 35 min, range 20–50 min). To reduce the survey length and respondent burden, the following items were removed:

- one item (2.8) requesting postcode of the radiation therapy department;
- two post-vignette items (9.2 and 9.3 repeated before and after the vignettes) related to the ‘perceived need and motivation for communication skills training’;

- one vignette and related items (6.12–6.16) as suggested by two respondents. One respondent suggested removing all vignettes; however, based on overall feedback and research team preference, two vignettes were retained.

#### *ii) Content*

Survey questions and response options were clear, appropriate and relevant according to 11 of 13 respondents. Three comments suggested neutral response options to three items (4.2, 8.2 and 8.4) would be preferable. These were existing items from survey tools, hence this change was not made, as the research team wanted to ensure comparability of results with previous studies.

One respondent noted requesting date of birth (DOB) may deter RTs from completing the survey. Researchers felt DOB was useful to enable more accurate data reporting and that participants were not at risk of being identified due to confidentiality protocols and the large sample size of the main survey. Consequently, DOB was changed to a non-mandatory field.

Following feedback from one respondent, one item (3.7) regarding training in the area of patient care, was reworded to include both face-to-face and online training.

#### *iii) Functionality*

Three respondents highlighted the absence of a ‘back’ button to view previous information. Therefore, a ‘back’ button was added.

#### *iv) Other*

Two respondents provided positive comments relating to the survey and research concept.

**Table 2.** Pilot feedback questions and response summary.

No.	Question <sup>1</sup>	No. of responses			
		Yes	No	DNA	n/a
1	How long did the survey take to complete? (median, range)	35 min (20–50 min)			
2	Is this acceptable?	6	7	–	–
3	Were any of the questions unclear?	2	11	–	–
4	Were any of the response options unclear?	2	11	–	–
5	Were any of the response options not appropriate or relevant?	2	11	–	–
6	Did any of the questions make you feel uncomfortable?	2	11	–	–
7	Did you answer the questions that made you feel uncomfortable?	3	3	4	3
8	Were all sections of the survey clearly explained?	11	0	2	–
9	Are there any questions you would like to see taken out of the survey?	2	9	2	–
10	Are there any questions you would like to add to the survey?	1	11	1	–
11	Do you have any further comments or feedback?	6	5	2	–
12	Are you willing to be contacted via phone to further discuss?	5	4	4	–

DNA, did not answer; n/a, not applicable; one participant did not complete questions 8–12.

<sup>1</sup>Complete pilot feedback question form can be requested from the corresponding author.

## Interviews

The pilot feedback form asked participants to provide consent and contact details if they were willing to be contacted for an interview. Five participants provided these details, however, the research team decided not to conduct interviews as the feedback was clear and consistent, and no further information would be gained.

## Additional Information

In addition to the pilot process, three medical radiation professionals (identified by professional medical radiation associations in Australia, New Zealand (NZ) and Canada) as well as one medical radiation academic reviewed the survey instrument and provided written feedback. The survey was sent to these reviewers as a word document via email and feedback was returned to the first author. This process was conducted after the pilot. This feedback was supportive and highlighted the value of this research. The concerns raised were survey length and the sensitive nature

**Table 3.** Pilot survey – respondent demographics.

Characteristic	Number (%)
Age (mean, range)	39 (25–54)
Number of years as a qualified RT (mean, range)	16 (1–31)
Sex	
Male	4 (31)
Female	9 (69)
Employment status	
Fulltime	9 (69)
Part time	4 (31)
Current role	
Clinical RT	11 (85)
Research RT	2 (15)
Type of organisation	
Public	7 (54)
Private	6 (46)
No. of RT staff in department (mean, range)	30 (10–50)
No. of linear accelerators in department (mean, range)	3 (2–5)

RT, radiation therapist.

of some questions. To address this, further modifications were made to reduce the number of items relating to each vignette, and open-ended questions were changed to

questions with multiple choice response options. Feedback regarding DOB was similar to comments made by a pilot respondent, thus confirming the decision to make DOB non-mandatory. Additional modifications included a 'Prefer not to answer' response option for items regarding: carer responsibilities, year RT commenced practice, and personal experience with anxiety.

## Discussion

An online survey was selected as an effective method to explore RT values, skills, training and knowledge regarding psychosocial support for patients undergoing radiation therapy. An online survey is an inexpensive, wide reaching approach, which enables collation and analysis of large volumes of data in a short timeframe.<sup>22</sup> Other multicentre surveys targeting RTs have yielded encouraging response rates in Australia, NZ and Canada, of 37–41%, 48% and 21–36% respectively<sup>7,12,14,30–34</sup>.

The 'RTs and Psychosocial Support Survey' instrument was developed to address gaps in the literature regarding provision of psychosocial support in the radiation

**Table 4.** Pilot feedback – summary of comments provided by respondents.

No.	Feedback comment	Domain (T, C, F, O)	Status (A, N)	Reason not actioned
1	Did 20 min then lost responses...started over... 30 min to complete	T/F	A	n/a
2	30 min is acceptable. Reduce scenarios to 2	T/C	A	n/a
	Slightly too long to do at work... but appropriate for enough information to be gathered	T	A	n/a
	15 min	T	A	n/a
	Yes, if organisation support is given	T	–	n/a
	Shorter would be better... but to get the information required this is okay	T	A	n/a
	I believe an acceptable time is 10–15 min	T	A	n/a
3	'Any of the following aspects of RT affected... ' might need 'potentially'	C	N	Existing tool
	... I was unsure of whether 'attendance' meant face to face training or ...online	C	A	n/a
4	Some of them could be more specific	C	N	Not specific
	The 'not sure' options could be 'sometimes' but then there might be... indecisiveness	C	N	Existing tool
	...a neutral option instead or along with the 'I don't know' option.	C	N	Existing tool
5	See above (included in other comments)	C	–	n/a
	The traumatic event ones were strange as I haven't had traumatic event	C	–	n/a
6	DOB	C	A	n/a
9	One scenario less	C	A	n/a
	I feel that all questions were relevant and should not be removed	C	–	n/a
	The case studies were not very useful. I would remove or just have one	C	N	Authors disagreed
10	Suggestions on the most optimal ways of effectively communicating	C	N	Authors disagreed
11	Great layout and very comprehensive	C	–	n/a
	...the second scenario story was on the previous page to the question, I went to go back and it went to the beginning of the survey and lost all my answers	F	A	n/a
	No back button on the survey	F	A	n/a
	... contained appropriate questions and answers however... a bit lengthy	T	A	n/a
	Fantastic	O	–	n/a
	This is an important topic and happy to contribute	O	–	n/a

n/a, not applicable; T, time; F, functionality; C, content; O, other; A, actioned; N, not actioned.

oncology setting<sup>18</sup> (Table 1). Existing items were embedded and literature-guided survey development to ensure data could be compared.

Piloting a survey is an important component of the development, feasibility and evaluation process.<sup>23,24,35</sup> The pilot was conducted to test the acceptability and suitability of the online survey and recruitment process among a convenience sample of RTs. RTs provided valuable information on content validity, face validity, length of survey and functionality. An 81% response rate and positive feedback indicated strong support for the survey and psychosocial care research in radiation therapy. This feedback was reinforced by professional associations who agreed to support, circulate and promote the main survey to their membership.

The pilot study resulted in a more concise survey instrument, with increased likelihood of completion by busy RTs. This survey instrument is potentially applicable in multiple radiation oncology departments globally, to assess RT values, skills, training and knowledge specific to detecting and managing patient anxiety. This instrument provides a contribution to the field of radiation therapy<sup>22</sup> that may be used by others in future research, with potential to improve the delivery of psychosocial care and reduce the number of patients with unmet psychosocial needs.

Following the pilot and instrument refinement, the main ‘Radiation Therapists and Psychosocial Support Survey’ was launched via Qualtrics to RTs in Australia, NZ and Canada. These countries formed the target demographic due to similarities in training, workforce and clinical practice. Publications related to RTs, psychosocial support and burnout produced by these countries further strengthened the decision to invite them to participate. Data yielded from this survey will be compared to existing literature to test generalisability across a larger sample. Results of the main survey will be detailed in future publications.

There were limitations to this study. First, surveys are susceptible to responder bias and we did not collect demographics of non-responders, or reason for not responding. Second, the survey was estimated to take 30 mins to complete and requested sensitive information. These factors may have led to RTs not completing the pilot survey. Lastly, all pilot participants were recruited from one Australian state. To address this issue of convenience sampling and assess survey content validity for a wider audience, the pilot survey was reviewed by local and international academics and professional associations.

## Conclusion

Piloting the online survey instrument was informative. Feedback provided by participating RTs resulted in

modifications to reduce survey length, clarify content and increase functionality of the instrument. The pilot process resulted in a refined survey instrument, which will minimise responder burden and drop out, and improve the likelihood of obtaining a representative sample of RTs in the main survey. These results demonstrate that the ‘Radiation Therapists and Psychosocial Support Survey’ is a useable instrument likely to yield informative results in exploring RTs values, skills, training and knowledge regarding patient anxiety and psychosocial support.

## Conflict of Interest

The authors declare no conflict of interest.

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## Supporting Information

Additional Supporting Information may be found in the online version of this article:

**Data S1:** Pilot Survey Questions.

**Data S2:** Feedback Questions.

**APPENDIX 3. Ethics approval - 7 April 2016**

**Research Integrity**

Human Research Ethics Committee

Thursday, 7 April 2016

Dr Haryana Dhillon  
Psychology; Faculty of Science  
Email: haryana.dhillon@sydney.edu.au

Dear Haryana

I am pleased to inform you that the University of Sydney Human Research Ethics Committee (HREC) has approved your project entitled "**What do radiation therapists know and do about patient anxiety?**".

Details of the approval are as follows:

**Project No.:** 2016/227

**Approval Date:** 07 April 2016

**First Annual Report Due:** 07 April 2017

**Authorised Personnel:** Dhillon Haryana; Elsner Kelly; Halkett Georgia K; Naehrig Diana;

**Documents Approved:**

Date Uploaded	Type	Document Name
02/04/2016	Recruitment Letter/Email	Clean version invitation to participate in pilot
02/04/2016	Questionnaires/Surveys	Survey output from qualtrics
23/02/2016	Recruitment Letter/Email	Reminder email
23/02/2016	Other Type	Thank you/CPD email
12/02/2016	Organisation Approval	Professional body correspondence

HREC approval is valid for four (4) years from the approval date stated in this letter and is granted pending the following conditions being met:

**Condition/s of Approval**

- Continuing compliance with the National Statement on Ethical Conduct in Research Involving Humans.
- Provision of an annual report on this research to the Human Research Ethics Committee from the approval date and at the completion of the study. Failure to submit reports will result in withdrawal of ethics approval for the project.
- All serious and unexpected adverse events should be reported to the HREC within 72 hours.



- All unforeseen events that might affect continued ethical acceptability of the project should be reported to the HREC as soon as possible.
- Any changes to the project including changes to research personnel must be approved by the HREC before the research project can proceed.
- Note that for student research projects, a copy of this letter must be included in the candidate's thesis.

**Chief Investigator / Supervisor's responsibilities:**

1. You must retain copies of all signed Consent Forms (if applicable) and provide these to the HREC on request.
2. It is your responsibility to provide a copy of this letter to any internal/external granting agencies if requested.

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours sincerely

[Redacted signature]

**Associate Professor Rita Shackel  
Chair  
Human Research Ethics Committee**

**This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007), NHMRC and Universities Australia Australian Code for the Responsible Conduct of Research (2007) and the CPMP/ICH Note for Guidance on Good Clinical Practice.**

**APPENDIX 4. Ethics approval following survey amendments - 2 August 2016**

**Research Integrity & Ethics Administration**  
Human Research Ethics Committee

Tuesday, 2 August 2016

Dr Haryana Dhillon  
Psychology; Faculty of Science  
Email: haryana.dhillon@sydney.edu.au

Dear Haryana

Your request to modify this project, which was submitted on 21 June 2016, has been considered.

After consideration of your response to the comments raised the project has been approved to proceed with the proposed amendments.

Details of the approval are as follows:

**Project Title:** What do radiation therapists know and do about patient anxiety?

**Project No.:** 2016/227

**Next Annual Report due:** 07 April 2017

**New Approved Documents:**

Date Uploaded	Type	Document Name
25/07/2016	Advertisements/Flyer	Survey

Please contact the Ethics Office should you require further information or clarification.

Sincerely



**Dr Helen Mitchell**  
Chair  
Deputy Chair Review Committee

**The University of Sydney HRECs are constituted and operate in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007) and the NHMRC's Australian Code for the Responsible Conduct of Research (2007).**

**APPENDIX 5. Ethics approved invitation to participate in main survey**

Dear Radiation Therapist,

Are you a qualified Radiation Therapist in Australia, New Zealand, or Canada?

Are you interested in advancing the Radiation Therapy profession and patient care?

We invite you to take part in a survey that aims to learn more about Radiation Therapists' knowledge, skills and interest in providing psychosocial support for people with cancer. Your participation will involve completing an online survey and will result in helping to determine the need for future professional development and patient interventions. Your experience and knowledge is important to help us understand how things are at the moment.

Participating in the survey will contribute to your CPD points (excludes some Canadian provinces).

If you are interested in taking part, **please click on the link below**, read the Participant Information Statement at the beginning of the survey. If you wish to take part, complete the online survey by proceeding through the questions.

[Radiation Therapists and Psychosocial Support Survey](#)

Thank you for your valuable time and input,

Kelly Elsner

Senior Radiation Therapist and  
Masters of Philosophy (Research) candidate, University of Sydney  
Contact: [kels6151@uni.sydney.edu.au](mailto:kels6151@uni.sydney.edu.au)

**APPENDIX 6. Ethics approved invitation to participate in pilot survey including pilot feedback form**

Email invitation

Dear Radiation Therapist,

You are invited to participate in reviewing a survey intended to capture experiences of Radiation Therapists in providing psychosocial support to patients.

The purpose of this review is to gain feedback from you regarding the information, timing, content and flow of our proposed survey. Your feedback will help refine the survey before it is distributed to Radiation Therapists throughout Australia, New Zealand and Canada.

If you are willing to review the survey please:

- read the feedback questions in the attachment;
- keep these questions handy when completing the survey and make notes as you see fit;
- read the Participant Information Statement at the beginning of the survey;
- complete the survey and record how long it takes you. It is anticipated to take 30 minutes;
- complete the feedback questions;
- email or fax your completed feedback form to the researchers as per details below.

If you wish to discuss your feedback or any other concerns with the pilot process please contact the researchers as per details below

Please Note: demographics will be separated from survey responses to ensure confidentiality and anonymity.

Research student  
Kelly Elsner  
[Kels6151@uni.sydney.edu.au](mailto:Kels6151@uni.sydney.edu.au)

University Supervisor  
Dr. Haryana Dhillon  
[Haryana.dhillon@sydney.edu.au](mailto:Haryana.dhillon@sydney.edu.au)  
Ph: +612 9036 5392  
Fax:+612 9036 5420

Thank you for your valuable time and input.

Kelly Elsner

Senior Radiation Therapist and  
MPhil candidate, University of Sydney

Attachment

**Feedback Questions**

1. How long did the survey take to complete?
  
2. Is this an acceptable time? If no, what is an acceptable time?
  
3. Were any of the questions unclear? If yes, please specify the question and explain the issue.
  
4. Were any of the response options unclear? If yes, please specify the response and explain the issue.
  
5. Were any of the response options not appropriate or relevant? If yes, please specify the response and explain the issue.
  
6. Did any of the questions make you feel uncomfortable? If yes, please specify the question and explain the issue.
  
7. Did you answer the questions that made you feel uncomfortable?



## **APPENDIX 7. Pilot survey**

## Radiation Therapists and Patient Anxiety

### Q1.1 Participant Information Statement

Dear Radiation Therapist,

You are invited to participate in this study which aims to learn more about Radiation Therapists' (RTs) knowledge, skills and interest in providing psychosocial support for people with cancer. Please read the information below and if you agree to participate, complete the online survey.

#### Survey Information

The survey may take 30 minutes to complete. You are able to save your responses and continue later. To do this, you must continue the survey on the same computer. Questions focus on your: knowledge and experience with patients exhibiting distress, role in providing information to patients, views on the provision of supportive care, current workplace practices and interest in communication skills training.

Your participation is voluntary. Your survey responses will be de-identified so that they remain anonymous and confidential. The researchers will not see your personal details such as name, email or place of work. Submission of the survey implies your consent. Once your survey has been submitted you will not be able to withdraw, because it will be anonymised data. Electronic data will be stored in a password-protected database. There will be no consequences for choosing not to participate.

At the end of the survey, you will be asked if you are willing to be contacted in the future to consider taking part in further studies that may follow on from this study. If you choose to leave your contact details, they will be stored separately to your survey responses to ensure anonymity and confidentiality are maintained. Leaving your details does not commit you to any future study, but enables us to contact you with an invitation to participate.

If you wish to claim CPD points, you will be asked to enter your email address at the end of the survey. An email will be sent to you to thank you for your participation in the survey. The AIR, CAMRT and NZIMRT will recognise this evidence to support your CPD claim. Number of points awarded are as per CPD program outlines (AIR 2.5 points per hour or part thereof, NZIMRT 1 point, CAMRT 1 point). Once again, this information will be stored separately to your survey responses to ensure anonymity and confidentiality are maintained.

#### Survey Results

Results will be used to develop training and support for RTs to improve patient care. The results will be published in peer reviewed journals and presented at professional forums. Results can be provided to you if you choose this option at the completion of the survey.

## Q1.2 Researchers

This study is being carried out as part of a Masters of Philosophy through the Central Clinical School, Sydney Medical School, University of Sydney. The researchers responsible are: Kelly Elsner, Senior Radiation Therapist, Chris O'Brien Lifehouse & MPhil candidate; Dr Haryana Dhillon, Behavioral Scientist & Research Fellow, CeMPED, University of Sydney; Dr Diana Naehrig, Honorary Associate, Sydney Medical School – Central, University of Sydney; Associate Professor Georgia Halkett, Senior Research Fellow, Lecturer and Radiation Therapist, Curtin University.

## Ethics

This study has been approved by the University of Sydney Ethics Review Committee, protocol number 2016/227. Any concerns or complaints about the conduct of this study should be directed to the Executive Officer: [ro.humanethics@sydney.edu.au](mailto:ro.humanethics@sydney.edu.au) or +612 8627 8176.

For other questions or concerns regarding the study please contact the researchers:

Kelly Elsner, Research Student      [kels6151@uni.sydney.edu.au](mailto:kels6151@uni.sydney.edu.au)

Haryana Dhillon, Supervisor      [Haryana.dhillon@sydney.edu.au](mailto:Haryana.dhillon@sydney.edu.au) or +612 9036 5392

If you are willing to proceed, please continue on with the survey.

Thank you for taking the time to contribute to our profession and patient care.

Q2.1 What is your sex?

- Male (1)
- Female (2)

Q2.2 What is your date of birth? (Please enter in the following format dd/mm/yyyy).

Q2.3 Do you have carer responsibilities in your personal life and if so what are they? Select all that apply.

- Yes, children (1)
- Yes, elderly family member or friend (2)
- Yes, unwell family member or friend (3)
- Yes, disabled family member or friend (4)
- Yes, other (5)
- No (6)

Q2.4 What year did you start work as a Radiation Therapist? (Please enter in the format yyyy).  
(Note: For some Australian RTs, this is the year you started your SPP/NPDP/PDY)

Q2.5 What is your current employment status?

- Full time (1)
- Part time (2)
- Casual (3)
- Not currently employed (4)
- Retired (5)
- Other, please specify below (e.g. on extended leave) (6) \_\_\_\_\_

Answer If What is your current employment status? Not currently employed Is Selected Or What is your current employment status? Retired Is Selected Or What is your current employment status? Other (e.g. on extended leave) Is Selected

Q2.6 Please answer the following questions with reference to the last radiation therapy job you had.

Q2.7 Which country are you working in?

- Australia (1)
- New Zealand (2)
- Canada (3)

Q2.8 What is the postcode of your work place?

Q2.9 What is your primary professional role?

- Clinical Radiation Therapist (1)
- Radiation Therapy Educator (4)
- Research Radiation Therapist (5)
- Manager (2)
- Other, please specify below (3) \_\_\_\_\_

Q2.10 What type of radiation oncology organisation do you work in?

- Public centre (1)
- Private centre (2)
- Other, please specify (3) \_\_\_\_\_

Q2.11 How many hours of direct patient care do you engage in per week, within your current role? (This will vary depending on your current rostered area i.e. planning or treatment.)

- None (1)
- 1-10 hours (2)
- 11 - 30 hours (3)
- More than 30 hours (4)

Q2.12 How many radiation therapy staff work in your department? (If unsure, please estimate)

Q2.13 How many linear accelerators (linac) are used to treat patients at your place of work?

Q2.14 How many radiation therapists are rostered to a linac on a usual day of operation?

Q2.15 How many patients are treated on a linac on a usual day of operation? Please estimate.

Q2.16 How many hours per day is the linac operating to treat patients? e.g. 8 hours

Q3.1 Communication Skills Training programs are designed for Health Care Professions (HCPs) to develop skills which enable them to build positive relationships with patients diagnosed with a long term illness. These programs focus on skills such as appropriate verbal communications, responding to non-verbal cues, active listening and expressing empathy. HCPs may participate in role plays with actors, who simulate patients by acting out challenging scenarios inspired by real life cases. Examples of cases may include patients with anxiety, depression, aggressive behaviour or distress.

Q3.2 How strongly do you rate your need for Communication Skills Training?

- Strong (1)
- Moderate (2)
- Low (3)
- None (4)

Q3.3 How strongly do you rate your motivation to complete Communication Skills Training?

- Strong (1)
- Moderate (2)
- Low (3)
- None (4)

Q3.4 How do you think Communication Skills Training would affect you and your work?

	Positive change (1)	Negative change (2)	No change (3)
Confidence in dealing with patients (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Efficiency in dealing with patients (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing emotional support for patients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing emotional support for patients' carers and significant others (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Showing respect for patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approachability (i.e. the patient's openness to approaching you for information) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing information to patients (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work related stress (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal well-being (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job satisfaction (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing support for colleagues (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3.5 Are there other ways Communication Skills Training may affect you and your work?

- Yes (1)
- No (2)

Answer If Are there other ways Communication Skills Training may impact you? Yes Is Selected

Q3.6 If yes, please specify.

Q3.7 Please indicate if and when you have participated in training in the following areas of patient care.

	Attended		Timeframe			
	Yes (1)	No (2)	Less than 1 year ago (1)	Between 1 and 5 years ago (2)	More than 5 years ago (3)	N/A (4)
Communication Skills Training (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Detecting and responding to emotional cues (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patient psychology (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patient counselling (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patient anxiety and depression (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3.8 Are there other areas of patient care training that you have participated in?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To What would stop you from accessing Co...

Q3.9 If yes, please specify details including name of training/course, focus of training/course and approximate year attended.

Q3.10 What would stop you from accessing Communication Skills Training? Select all that apply.

- Interest (1)
- Course costs (2)
- Location of courses (3)
- Personal time (4)
- Personal energy (5)
- Release time from work to attend training (6)
- Managerial support (7)
- Organisational support (8)
- Co-worker perceptions (9)

Q3.11 Are there any other issues that would stop you accessing Communication Skills Training?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q3.12 If yes, please specify.

Q4.1 We are interested in the "value" of radiation therapists' abilities to interact with emotional patients. The following questions refer to "emotional" patients and "psychosocial" issues. These terms have been defined here for clarity. An "emotional" patient is one who is markedly aroused or agitated in feeling or sensibilities. An "emotional patient" may display signs of crying, not coping well, being at a loss for words, being agitated, upset, or angry. "Psychosocial" refers to both psychological and social behaviour. Assessing the psychosocial well-being of a patient relates to noticing how the patient is coping with respect to their mental, emotional, social and spiritual well-being. Please keep these definitions of "emotional patient" and "psychosocial" in mind for the remainder of the survey.

Q4.2 For the statements below, please indicate the response that best matches your opinion (Agree, Disagree, or Don't know)

	Agree (1)	Disagree (2)	Don't know (3)
Patient care and support is the main reason I entered this profession (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organisation (e.g. hospital, clinic) values my providing support to emotional patients (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My work colleagues (other radiation therapists) value my providing support to emotional patients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other members of the health care team value my providing support to emotional patients (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At my workplace it is expected that radiation therapists provide support to emotional patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The focus of radiation therapy should be on technical innovations rather than patient care (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emphasis on technical skills is driving recruitment and retention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>processes for radiation therapists (7)</p> <p>My patients feel questions about the psychosocial aspects of their lives are irrelevant (8)</p> <p>A patient's family will reject the idea of radiation therapists dealing with psychosocial issues (9)</p> <p>Patients are not open to radiation therapists dealing with psychosocial issues (10)</p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>
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Q5.1 Being distant is often recognised as a sign of depression. Can you think of recognisable signs of ANXIETY? Please list 3 or more.

Q5.2 How confident do you feel when dealing with a patient showing signs of anxiety?

- Very Confident (1)
- Somewhat confident (2)
- A little confident (3)
- Not at all confident (4)

Q5.3 Are any of the following aspects of radiation therapy affected when treating an anxious patient?

	Yes (1)	No (2)
Time to manage the patient (1)	<input type="radio"/>	<input type="radio"/>
Time to treat the patient (2)	<input type="radio"/>	<input type="radio"/>
Safe treatment delivery (3)	<input type="radio"/>	<input type="radio"/>
Accurate treatment delivery (4)	<input type="radio"/>	<input type="radio"/>
Staffing levels (5)	<input type="radio"/>	<input type="radio"/>
Daily appointment schedule (6)	<input type="radio"/>	<input type="radio"/>
My emotional state (7)	<input type="radio"/>	<input type="radio"/>
Emotional state of fellow RTs (8)	<input type="radio"/>	<input type="radio"/>
My work related stress levels (9)	<input type="radio"/>	<input type="radio"/>
My job satisfaction (10)	<input type="radio"/>	<input type="radio"/>
My confidence (11)	<input type="radio"/>	<input type="radio"/>

Q5.4 Are any other aspects of radiation therapy affected?

- Yes (1)
- No (2)

Answer If Are there any other aspects of Radiation Therapy that are impacted by an anxious patient? Yes Is Selected

Q5.5 If yes, please specify.

Q5.6 Have you been involved in detecting and dealing with anxiety outside of your professional work? That is, in yourself, or others in your personal life.

- Yes (1)
- No (2)

Answer If Have any experiences in your personal life involved detecting and managing anxiety?  
Yes Is Selected

Q5.7 If yes, who was the person experiencing anxiety? Select all that apply.

- Myself (1)
- A family member (2)
- A close friend (3)
- A partner (4)
- Other (5)
- Prefer not to answer (6)

Q6.1 For the following three vignettes, read the case and then answer the questions regarding the patient presented. Answer honestly and note that "I don't know" is an acceptable answer.

Q6.2 Vignette 1 – Alex

Alex is 63 years old and has been diagnosed with metastatic lung cancer. The Radiation Oncologist has informed Alex of a poor prognosis and recommended a palliative radiation therapy treatment regimen. Alex presents for the first day of radiation therapy accompanied by a friend. In the waiting room Alex is sitting straight and rigid, with hands clasped holding a tissue and appears a bit tearful. Alex is quiet but attentive, nodding in response to information you give, although you do notice that Alex has asked you to repeat information a couple of times. Alex asks some questions about radiation damage to the body and is then willing to proceed with treatment.

Q6.3 Which of the following descriptions would you apply to Alex? Select all that apply.

- Depressed (11)
- Happy (1)
- Angry (2)
- Calm (3)
- Sad (4)
- Cheerful (5)
- Distressed (6)
- Worried (7)
- Relaxed (9)
- Anxious (8)
- I don't know (10)

Q6.4 What signals led you to select these responses?

Q6.5 What would you do to help Alex?

Q6.6 Do you think a referral to a psychosocial care giver would be appropriate for Alex?

- Yes (1)
- Maybe (2)
- No (3)
- I don't know (4)

Q6.7 Vignette 2 - Pat

Pat is 46 years old, has been diagnosed with lymphoma and is aware of the likelihood of a good prognosis. The Radiation Oncologist has recommended a curative radiation therapy treatment regimen. Pat arrives alone for the radiation therapy planning session (CT simulation) and appears rushed and agitated. Pat asks many questions about simulation and the planned treatment. Pat does not appear to be listening to your responses and keeps asking questions, sounding increasingly annoyed. Pat has many complaints about having to attend radiotherapy

and does not believe that the appointment times will fit into daily life. Pat does not wish to have tattoos and demands to see the doctor before agreeing to proceed with the session.

Q6.8 Which of the following descriptions would you apply to Pat? Select all that apply.

- Depressed (11)
- Happy (1)
- Angry (2)
- Calm (3)
- Sad (4)
- Cheerful (5)
- Distressed (6)
- Worried (7)
- Relaxed (9)
- Anxious (8)
- I don't know (10)

Q6.9 What signals led you to select these responses?

Q6.10 What would you do to help Pat?

Q6.11 Do you think a referral to a psychosocial care giver would be appropriate for Pat?

- Yes (1)
- Maybe (2)
- No (3)
- I don't know (4)

Q6.12 Vignette 3 - Taylor

Taylor is 24 years old and has been diagnosed with a sarcoma. The Radiation Oncologist informed Taylor of a possibly poor prognosis but recommended a curative radiation therapy treatment regimen. Taylor and Taylor's mother arrive for the first radiation therapy treatment. Taylor is fiddling with car keys and reports concern about being able to lie still for treatment, not being able to sleep last night and feeling nauseous.

Q6.13 Which of the following descriptions would you apply to Taylor? Select all that apply.

- Depressed (11)
- Happy (1)
- Angry (2)
- Calm (3)
- Sad (4)
- Cheerful (5)
- Distressed (6)
- Worried (7)
- Relaxed (9)
- Anxious (8)
- I don't know (10)

Q6.14 What signals led you to select these responses?

Q6.15 What would you do to help Taylor?

Q6.16 Do you think a referral to a psychosocial care giver would be appropriate for Taylor?

- Yes (1)
- Maybe (2)
- No (3)
- I don't know (4)

Q7.1 The following questions refer to your current workplace practices. They explore processes of screening patients for anxiety, depression and/or distress, available psychosocial support services and processes of referring patients.

Q7.2 Does your workplace have access to the following psychosocial support services? Select all that apply.

- Psycho-oncology (1)
- Social work (2)
- Counselling (3)
- Psychology (4)
- Other, please specify below (5) \_\_\_\_\_

Q7.3 In your workplace, are patients formally screened for anxiety, depression and/or distress?

- Yes (1)
- No (2)
- I don't know (3)

If Yes Is Not Selected, Then Skip To Do you personally refer patients to p...

Q7.4 Who routinely does the screening? Select one option only.

- Radiation Oncology Consultant or Trainee (1)
- Radiation Therapist (4)
- Radiation Nurse (5)
- Administrative staff (7)
- Other, please specify below (6) \_\_\_\_\_

Q7.5 Are screening results communicated to you?

- Always (15)
- Most of the time (16)
- Rarely (17)
- Never (18)

If Never Is Selected, Then Skip To Do you personally refer patients to p...

Q7.6 How are the results communicated? Select all that apply.

- Written communication (e.g. Radiation therapy information systems e.g., ARIA, MOSAIQ; inpatient notes or email) (1)
- Verbal communication (2)
- Other, please specify below (4) \_\_\_\_\_

Q7.7 Do screening results affect how you approach the patient?

- Always (16)
- Most of the time (17)
- Rarely (18)
- Never (3)

Q7.8 Do you personally refer patients to psychosocial support services?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q7.9 Do you communicate your referral to others?

- Always (22)
- Most of the time (23)
- Rarely (24)
- Never (25)

If Never Is Selected, Then Skip To End of Block

Q7.10 Who do you communicate the referral to? Select all that apply.

- Patient (1)
- Patient's family or carer (2)
- Radiation Oncology Consultant or Trainee (3)
- Other Radiation Therapists (4)
- Radiation Nurse (5)
- Other, please specify below (6) \_\_\_\_\_

Q7.11 How do you communicate the referral? Select all that apply.

- Written communication (e.g. Radiation therapy information systems e.g.,. ARIA, MOSAIQ; inpatient notes or email) (1)
- Verbal communication (2)
- Other, please specify below (3) \_\_\_\_\_

Q8.1 Sometimes the environment in which we work, plays a role in our ability to interact with emotional patients. This can include the availability of physical, educational and supportive resources.

Q8.2 For the statements below, indicate the response that best matches your opinion.

	Agree (1)	Disagree (2)	I don't know (3)
I am too busy at work to provide support to emotional patients (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no time in the schedule to provide support to emotional patients (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often have to prioritise technical demands over support to emotional patients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing treatment complexity has reduced the time available to provide support to emotional patients (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am too exhausted to provide support to emotional patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8.3 Consider your current workplace practices when providing answers to the following statement. Select all that apply. "When confronted with an emotional patient, I am able to....."

- Take them to a private room to talk (1)
- Talk with them inside the treatment room or control area (2)
- Call on another colleague to cover me while I speak with the patient (3)
- Refer the patient to someone else they can talk with (4)
- Other, please specify below (5) \_\_\_\_\_

Q8.4 For the statements below, indicate the response that best matches your opinion.

	Yes (1)	No (2)	I don't know (3)
I have enough time to fully communicate with emotional patients (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are sufficient radiation therapists to take over my duties while I communicate with an emotional patient (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are support services I can access to help an emotional patient (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am aware of how to access support services to help an emotional patient (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can go to my manager or supervisor for support when I care for an emotional patient (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can go to the patient's radiation oncologist for support when I care for an emotional patient (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have access to patient education materials to help support emotional patients (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are educational resources available to me to improve my ability to communicate with emotional patients (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are supportive resources available to me to help me deal with providing support to emotional patients (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My team supports me emotionally when I deal with emotional patients (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Q9.1 Communication Skills Training programs (CST) are designed for Health Care Professionals (HCPs) to develop skills that enable them to build positive relationships with patients diagnosed with a long term illness. You have already answered some questions regarding CST. Please answer the following questions quickly, without dwelling on your responses.

Q9.2 How strongly do you rate your need to complete Communication Skills Training?

- Strong (1)
- Moderate (2)
- Low (3)
- None (4)

Q9.3 How strongly do you rate your motivation to complete Communication Skills Training?

- Strong (1)
- Moderate (2)
- Low (3)
- None (4)

Q10.1 The following questions ask about your feelings and methods of coping with work related issues.

Q10.2 Have you ever used services to help deal with work related stresses of any kind? Types of services may include employee assistance programs, counsellor, debriefing services, G.P., psychologist, mental health services, etc.

- Yes (1)
- No (2)
- Prefer not to answer (3)

Answer If Have you ever used services to help deal with work related stresses of any kind?  
Types of service... Yes Is Selected

Q10.3 Please approximate when you last accessed these services.

- Within the last 12 months (1)
- 1 to 5 years ago (2)
- More than 5 years ago (3)
- Prefer not to answer (4)

Q10.4 As a radiation therapist, being a "helper" and assisting patients and families cope with cancer is part of your role. When you help people, you have direct contact with their lives. As you may have found, your compassion for those you help can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a "helper". Consider each of the following questions about you and your current work situation. Select the option that honestly reflects how frequently you have experienced these things in the last 30 days.

	Very Often (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)
I am happy (1)	<input type="radio"/>				
I am preoccupied with more than one person I help (2)	<input type="radio"/>				
I get satisfaction from being able to help people (3)	<input type="radio"/>				
I feel connected to others (4)	<input type="radio"/>				
I jump or am startled by unexpected sounds (5)	<input type="radio"/>				
I feel invigorated after working with those I help (6)	<input type="radio"/>				
I find it difficult to separate my personal life from my life as a helper (7)	<input type="radio"/>				
I am not as productive at work because I am losing sleep over traumatic	<input type="radio"/>				

experiences of a person I help (8)					
I think that I might have been affected by the traumatic stress of those I help (9)	<input type="radio"/>				
I feel trapped by my job as a helper (10)	<input type="radio"/>				
Because of my helping I have felt "on edge" about various things (11)	<input type="radio"/>				
I like my work as a helper (12)	<input type="radio"/>				
I feel depressed because of the traumatic experiences of the people I help (13)	<input type="radio"/>				
I feel as though I am experiencing the trauma of someone I have helped (14)	<input type="radio"/>				
I have beliefs that sustain me (15)	<input type="radio"/>				
I am pleased how I am able to keep up with helping techniques and protocols (16)	<input type="radio"/>				

I am the person I always wanted to be (17)	<input type="radio"/>				
My work makes me feel satisfied (18)	<input type="radio"/>				
I feel worn out because of my work as a helper (19)	<input type="radio"/>				
I have happy thoughts and feelings about those I help and how I could help them (20)	<input type="radio"/>				
I feel overwhelmed because my work load seems endless (21)	<input type="radio"/>				
I believe I can make a difference through my work (22)	<input type="radio"/>				
I avoid certain activities or situations because they remind me of frightening experiences of the people I help (23)	<input type="radio"/>				
I am proud of what I can do to help (24)	<input type="radio"/>				
As a result of my helping I have intrusive,	<input type="radio"/>				

frightening thoughts (25)					
I feel "bogged down" by the system (26)	<input type="radio"/>				
I have thoughts that I am a "success" as a helper (27)	<input type="radio"/>				
I can't recall important parts of my work with trauma victims (28)	<input type="radio"/>				
I am a very caring person (29)	<input type="radio"/>				
I am happy that I chose to do this work (30)	<input type="radio"/>				

Q10.5 If these questions have raised concerns and you feel you may be suffering stress or burnout, please contact local services for support such as: your manager, employee assistance program representative, G.P., professional body, Lifeline or other group.

Q11.1 Do you have any other comments you would like to add?

- Yes (1)
- No (2)

Answer If Do you have any other comments you would like to add? Yes Is Selected

Q11.2 If yes, please specify.

Q11.3 Please remember, your survey responses will remain anonymous. Any details that you provide in the following questions will remain confidential. Your contact information will be extracted and stored separately to your survey responses.

Q11.4 What further involvement would you like to have after this survey? (Select all that apply)

- I want to claim CPD points for survey completion (1)
- I would like to receive the results of this study once completed (2)
- I am willing to be contacted in the future, to consider taking part in further work that results from this study (3)
- I do not wish to have any further involvement (4)

If I do not wish to have any f... Is Selected, Then Skip To End of Block

Answer If What further involvement would you like to have after this survey? (Select all that apply) I want to claim CPD points for survey completion Is Selected

Q11.5 Please enter your email address to receive an email to support your claim for CPD points

Answer If What further involvement would you like to have after this survey? (Select all that apply) I would like to receive the results of this study once completed Is Selected

Q11.6 Please enter your email address to receive results of this study

Answer If What further involvement would you like to have after this survey? (Select all that apply) I am willing to be contacted in the future, to consider taking part in further work that results from this study Is Selected And Which country are you working in? Australia Is Selected

Q11.7 Please enter the following details so that we may invite you to participate in further work resulting from this study.

First name (1)

Last name (2)

Phone number (AUS) (3)

Email address (11)

Answer If What further involvement would you like to have after this survey? (Select all that apply) I am willing to be contacted in the future, to consider taking part in further work that results from this study Is Selected And Which country are you working in? New Zealand Is Selected

Q11.8 Please enter the following details so that we may invite you to participate in further work resulting from this study.

First name (1)

Last name (2)

Phone number (NZ) (3)

Email address (11)

Answer If What further involvement would you like to have after this survey? (Select all that apply) I am willing to be contacted in the future, to consider taking part in further work that results from this study Is Selected And Which country are you working in? Canada Is Selected

Q11.9 Please enter the following details so that we may invite you to participate in further work resulting from this study.

First name (1)

Last name (2)

Phone number (CA) (3)

Email address (11)

## **APPENDIX 8. Main survey**

## **Radiation Therapists and Psychosocial Support Survey**

### Section 1 – Participant Information Statement

#### Q1.1 Participant Information Statement

Dear Radiation Therapist,

You are invited to participate in this study which aims to learn more about Radiation Therapists' (RTs) knowledge, skills and interest in providing psychosocial support for people with cancer. Please read the information below and if you agree to participate, complete the online survey.

#### Survey Information

Questions focus on your: knowledge and experience with patients exhibiting distress, role in providing information to patients, views on the provision of supportive care, current workplace practices and interest in communication skills training.

Your participation is voluntary. Your survey responses will be de-identified so that they remain anonymous and confidential. The researchers will not see your personal details such as name, email or place of work. Submission of the survey implies your consent. Once your survey has been submitted you will not be able to withdraw, because it will be anonymised data. Electronic data will be stored in a password-protected database. There will be no consequences for choosing not to participate.

#### Important notes:

- The survey may take 30 minutes to complete
- You are able to exit prior to completing the survey by closing the window, your responses will be saved, and you can continue later by using the same link to access the survey on the same computer
- Do not use the 'Back' button on the browser as you may lose your responses. Use the 'Previous' button in the survey only

At the end of the survey, you will be asked if you are willing to be contacted in the future to consider taking part in further studies that may follow on from this study. If you choose to leave your contact details, they will be stored separately to your survey responses to ensure anonymity and confidentiality are maintained. Leaving your details does not commit you to any future study but enables us to contact you with an invitation to participate.

If you wish to claim CPD points, you will be asked to enter your email address at the end of the survey. An email will be sent to you to thank you for your participation in the survey (if you do not find an email in your inbox, check your spam/junk mail). The AIR, CAMRT and NZIMRT will recognise this evidence to support your CPD claim. Number of points awarded are as per CPD program outlines (AIR 2.5 points per hour or part thereof, NZIMRT 1 point, CAMRT dependent

on province). Once again, this information will be stored separately to your survey responses to ensure anonymity and confidentiality are maintained.

### Survey Results

Results will be used to develop training and support for RTs to improve patient care. The results will be published in peer reviewed journals and presented at professional forums. Results can be provided to you if you choose this option at the completion of the survey.

### Researchers

This study is being carried out as part of a Master of Philosophy through the Central Clinical School, Sydney Medical School, University of Sydney. The researchers responsible are:

- Kelly Elsner, Senior Radiation Therapist & Master of Philosophy (Research) candidate;
- Dr Haryana Dhillon, Behavioral Scientist & Research Fellow, CeMPED, University of Sydney;
- Dr Diana Naehrig, Honorary Associate, Sydney Medical School – Central, University of Sydney; Associate Professor Georgia Halkett, Senior Research Fellow, Lecturer and Radiation Therapist, Curtin University.

### Ethics

This study has been approved by the University of Sydney Human Research Ethics Committee, protocol number 2016/227. Any concerns or complaints about the conduct of this study should be directed to the:

- Executive Officer                      [ro.humanethics@sydney.edu.au](mailto:ro.humanethics@sydney.edu.au) or +612 8627 8176.

For other questions or concerns regarding the study please contact the researchers:

- Kelly Elsner, Research Student                      [kels6151@uni.sydney.edu.au](mailto:kels6151@uni.sydney.edu.au)
- Haryana Dhillon, Supervisor                      [Haryana.dhillon@sydney.edu.au](mailto:Haryana.dhillon@sydney.edu.au)  
+612 9036 5392

If you are willing to proceed, please continue on with the survey.

Thank you for taking the time to contribute to our profession and patient care.

## Section 2 - Demographics

Q2.1 What is your sex?

- Male (1)
- Female (2)
- Other (3)
- Prefer not to answer (4)

Q2.2 What is your date of birth? (Please enter in the following format dd/mm/yyyy).

Q2.3 Do you have carer responsibilities in your personal life and if so what are they? Select all that apply.

- Yes, children (1)
- Yes, elderly family member or friend (2)
- Yes, unwell family member or friend (3)
- Yes, disabled family member or friend (4)
- Yes, other (5)
- No (6)
- Prefer not to answer (7)

Q2.4 What year did you start work as a Radiation Therapist? (Please enter in the format yyyy.)

Note: For some Australian RTs, this is the year you started your SPP/NPDP/PDY

Q2.5 Are you currently employed as a Radiation Therapist?

- Full time (1)
- Part time (2)
- Casual (3)
- Not currently employed (4)
- Retired (5)
- Other (e.g. qualified as an RT but currently working as a manager, researcher, educator, academic, or in another field) (6)

Answer If Are you currently employed as a Radiation Therapist? Other Is Selected

Q2.6 If other, please specify your current role/situation (e.g. working in another field).

Answer If Are you currently employed as a Radiation Therapist? Not currently employed as a Radiation Therapist Is Selected Or Are you currently employed as a Radiation Therapist? Retired Is Selected Or Are you currently employed as a Radiation Therapist? Other, please specify below (e.g. on extended leave) Is Selected

Q2.7 Please answer the following questions with reference to your most recent radiation therapy job.

Q2.8 Which country are you working in?

- Australia (1)
- New Zealand (2)
- Canada (3)

Q2.10 What type of radiation oncology organisation do you work in?

- Public centre (1)
- Private centre (2)
- Other (3)

Answer If What type of radiation oncology organisation do you work in? Other Is Selected

Q2.11 If other, please specify

Q2.12 How many hours of direct patient care do you engage in per week? (This may vary depending on your current rostered area i.e. planning or treatment.)

- None (1)
- 1-10 hours (2)
- 11 - 30 hours (3)
- More than 30 hours (4)

Q2.13 How many radiation therapy staff work in your department? Please estimate.

Q2.14 How many linear accelerators (linacs) are used to treat patients at your place of work?

Q2.15 How many radiation therapists are rostered to a linac on a usual day of operation?

Q2.16 How many patients are treated on a linac on a usual day of operation? Please estimate.

Q2.17 How many hours per day is the linac operating to treat patients? Answer in hours e.g. 8 or 8.5

### Section 3 – Communication Skills Training (CST)

Q3.1 Communication Skills Training programs are designed for Health Care Professions (HCPs) to develop skills which enable them to build relationships with patients diagnosed with a long term illness. These programs focus on skills such as appropriate verbal communications, responding to non-verbal cues, active listening and expressing empathy. HCPs may participate in role plays with actors, who simulate patients by acting out challenging scenarios inspired by real life cases. Examples of cases may include patients with anxiety, depression, aggressive behaviour or distress.

Q3.2 How strongly do you rate your need for Communication Skills Training?

- Strong (1)
- Moderate (2)
- Low (3)
- None (4)

Q3.3 How strongly do you rate your motivation to complete Communication Skills Training?

- Strong (1)
- Moderate (2)
- Low (3)
- None (4)

Q3.4 How do you think Communication Skills Training would affect you and your work?

	Positive change (1)	Negative change (2)	No change (3)
Confidence in dealing with patients (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Efficiency in dealing with patients (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing emotional support for patients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing emotional support for patients' carers and significant others (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Showing respect for patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approachability (i.e. the patient's openness to approaching you for information) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing information to patients (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work related stress (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal well-being (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job satisfaction (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing support for colleagues (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3.5 Are there other ways Communication Skills Training may affect you and your work?

- Yes (1)
- No (2)

Answer If Are there other ways Communication Skills Training may impact you? Yes Is Selected

Q3.6 If yes, please specify.

Q3.7 Please indicate if and when you have participated in a form of training in the following areas of patient care (include face-to-face or online). If you answer 'Yes' you will need to select a timeframe also. If you answer 'No', you will need to select 'N/A'.

	Attended		Timeframe			
	Yes (1)	No (2)	Less than 1 year ago (1)	Between 1 and 5 years ago (2)	More than 5 years ago (3)	N/A (4)
Communication Skills Training (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Detecting and responding to emotional cues (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patient psychology (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patient counselling (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patient anxiety and depression (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3.8 Are there other areas of patient care training that you have participated in?

- Yes (1)
- No (2)

Answer If Are there other areas of patient care training that you have participated in? Yes Is Selected

Q3.9 If yes, please specify details including name of training/course, focus of training/course and approximate year attended.

Q3.10 What would stop you from accessing Communication Skills Training? Select all that apply.

- Interest (1)
- Course costs (2)
- Location of courses (3)
- Personal time (4)
- Personal energy (5)
- Release time from work to attend training (6)
- Managerial support (7)
- Organisational support (8)
- Co-worker perceptions (9)

Q3.11 Are there any other issues that would stop you accessing Communication Skills Training?

- Yes (1)
- No (2)

Answer If Are there any other issues that would stop you accessing Communication Skills Training? Yes Is Selected

Q3.12 If yes, please specify.

## Section 4 – Perceived value of radiation therapist interactions with patients

Q4.1 We are interested in the perceived value of radiation therapists' interactions with emotional patients. The following questions refer to "emotional" patients and "psychosocial" issues. These terms have been defined here for clarity.

An "emotional" patient is one who is markedly aroused or agitated in feeling or sensibilities. An "emotional patient" may display signs of crying, not coping well, being at a loss for words, being agitated, upset, or angry.

"Psychosocial" refers to both psychological and social behaviours. Assessing the psychosocial well-being of a patient relates to noticing how the patient is coping with respect to their mental, emotional, social and spiritual well-being.

Please keep the definitions of "emotional" and "psychosocial" in mind for the remainder of the survey.

Q4.2 For the statements below, please indicate the response that best matches your opinion.

	Agree (1)	Disagree (2)	Don't know (3)
Patient care and support is the main reason I entered this profession (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organisation (e.g. hospital, clinic) values my providing support to emotional patients (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My work colleagues (other radiation therapists) value my providing support to emotional patients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other members of the health care team value my providing support to emotional patients (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At my workplace it is expected that radiation therapists provide support to emotional patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The focus of radiation therapy should be on technical innovations rather than patient care (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emphasis on technical skills is driving recruitment and retention processes for radiation therapists (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My patients feel questions about the psychosocial aspects of their lives are irrelevant (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A patient's family will reject the idea of radiation therapists dealing with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

psychosocial issues (9) Patients are not open to radiation therapists dealing with psychosocial issues (10)	○	○	○
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### Section 5 – Theoretical knowledge of anxiety

Q5.1 Being distant is often recognised as a sign of depression. Can you think of recognisable signs of ANXIETY? Please list 3 or more. Leave blank if you do not know any.

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)

Q5.2 How confident do you feel when dealing with a patient showing signs of anxiety?

- Very Confident (1)
- Somewhat confident (2)
- A little confident (3)
- Not at all confident (4)

Q5.3 Are any of the following aspects of radiation therapy affected when treating an anxious patient?

	Yes (1)	No (2)
Time to manage the patient (1)	<input type="radio"/>	<input type="radio"/>
Time to treat the patient (2)	<input type="radio"/>	<input type="radio"/>
Safe treatment delivery (3)	<input type="radio"/>	<input type="radio"/>
Accurate treatment delivery (4)	<input type="radio"/>	<input type="radio"/>
Staffing levels (5)	<input type="radio"/>	<input type="radio"/>
Daily appointment schedule (6)	<input type="radio"/>	<input type="radio"/>
My emotional state (7)	<input type="radio"/>	<input type="radio"/>
Emotional state of fellow RTs (8)	<input type="radio"/>	<input type="radio"/>
My work related stress levels (9)	<input type="radio"/>	<input type="radio"/>
My job satisfaction (10)	<input type="radio"/>	<input type="radio"/>
My confidence (11)	<input type="radio"/>	<input type="radio"/>

Q5.4 Are any other aspects of radiation therapy affected?

- Yes (1)
- No (2)

Answer If Are there any other aspects of Radiation Therapy that are impacted by an anxious patient? Yes Is Selected

Q5.5 If yes, please specify.

Q5.6 Have you been involved in detecting and dealing with anxiety outside of your professional work? That is, in yourself, or others in your personal life.

- Yes (1)
- No (2)

Answer If Have any experiences in your personal life involved detecting and managing anxiety?  
Yes Is Selected

Q5.7 If yes, who was the person experiencing anxiety? Select all that apply.

- Myself (1)
- A family member (2)
- A close friend (3)
- A partner (4)
- Other (5)
- Prefer not to answer (6)

## Section 6 – Detecting and managing anxiety using vignettes

Q6.1 For the following two vignettes, read the case and answer the questions with respect to how you would respond in your current working environment (or last Radiation Therapist job). Answer honestly and quickly.

Q6.2 Vignette 1 - Alex Alex is 63 years old and has been diagnosed with metastatic lung cancer. The Radiation Oncologist has informed Alex of a poor prognosis and recommended a palliative radiation therapy treatment regimen. Alex presents for the first day of radiation therapy accompanied by a friend. In the waiting room Alex is fiddling with car keys. Alex is quiet but attentive, nodding in response to information you give. Alex expresses concern about being able to lie still for the treatment, feeling nauseous and not sleeping well last night. Alex is willing to proceed with treatment.

Q6.3 Which of the following descriptions would you apply to Alex? Select all that apply.

- Depressed (11)
- Happy (1)
- Angry (2)
- Calm (3)
- Sad (4)
- Content (5)
- Distressed (6)
- Worried (7)
- Relaxed (9)
- Anxious (8)
- I don't know (10)

Q6.4 What signals led you to select these responses? Indicate as few or as many signals you feel are relevant. Leave blank if you do not know.

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q6.5 What would you do to help Alex? Select all that apply.

- Tell Alex there is no reason to be concerned and get treatment started as quickly as possible (1)
- Discuss referral to psychosocial care with Alex (2)
- Acknowledge Alex's feelings and encourage Alex to express concerns and ask questions (3)
- Contact the Radiation Oncologist or nurse to speak with Alex prior to treatment (4)
- Suggest involving Alex's friend in treatment set-up (5)
- Other (6)

Answer If What would you do to help Alex? Select all that apply. Other Is Selected

Q6.6 If other, please specify

Q6.7 Vignette 2 - Pat Pat is 46 years old, has been diagnosed with lymphoma and is aware of the likelihood of a good prognosis. The Radiation Oncologist has recommended a curative radiation therapy treatment regimen. Pat arrives alone for the radiation therapy planning session (CT simulation) and appears rushed and agitated. Pat asks many questions about simulation and the planned treatment. Pat does not appear to be listening to your responses and keeps asking questions, sounding increasingly annoyed. Pat has many complaints about having to attend radiotherapy and does not believe that the appointment times will fit into daily life. Pat does not wish to have tattoos and demands to see the doctor before agreeing to proceed with the session.

Q6.8 Which of the following descriptions would you apply to Pat? Select all that apply.

- Depressed (11)
- Happy (1)
- Angry (2)
- Calm (3)
- Sad (4)
- Content (5)
- Distressed (6)
- Worried (7)
- Relaxed (9)
- Anxious (8)
- I don't know (10)

Q6.9 What signals led you to select these responses? Indicate as few or as many signals you feel are relevant. Leave blank if you do not know.

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Q6.10 What would you do to help Pat? Select all that apply.

- Tell Pat there is no reason to be concerned and get treatment started as quickly as possible (1)
- Discuss referral to psychosocial care with Pat (2)
- Acknowledge Pat's feelings and encourage Pat to express concerns and ask questions (3)
- Contact the Radiation Oncologist or nurse to speak with Pat prior to treatment (4)
- Suggest involving a friend or family member of Pat's in treatment set-up (5)
- Other (6)

Answer If What would you do to help Pat? Select all that apply. Other Is Selected

Q6.11 If other, please specify

## Section 7 - Current work practices

Q7.1 The following questions refer to your current workplace practices. They explore processes of screening patients for anxiety, depression and/or distress, available psychosocial support services and processes of referring patients.

Q7.2 Does your workplace have access to the following psychosocial support services? Select all that apply.

- Psycho-oncology (1)
- Social work (2)
- Counselling (3)
- Psychology (4)
- Other services (5)
- No access to any of these services (7)
- I don't know (6)

Answer If Does your workplace have access to the following psychosocial support services? Select all that a... Other Is Selected

Q7.3 If other, please specify

Q7.4 In your workplace, are patients formally screened for anxiety, depression and/or distress?

- Yes (1)
- No (2)
- I don't know (3)

If Yes Is Not Selected, Then Skip To Do you personally refer patients to p...

Q7.5 Who routinely does the screening? Select one option only.

- Radiation Oncology Consultant or Trainee (1)
- Radiation Therapist (4)
- Radiation Nurse (5)
- Administrative staff (7)
- Other (6)

Answer If Who routinely does the screening? Select one option only. Other Is Selected

Q7.6 If other, please specify

Q7.7 Are screening results communicated to you?

- Always (15)
- Most of the time (16)
- Rarely (17)
- Never (18)

If Never Is Selected, Then Skip To Do you personally refer patients to p...

Q7.8 How are the results communicated? Select all that apply.

- Written communication (Radiation therapy information systems e.g. ARIA, MOSAIQ; inpatient notes or email) (1)
- Verbal communication (2)
- Other (4)

Answer If How are the results communicated? Select all that apply. Other Is Selected

Q7.9 If other, please specify

Q7.10 Do screening results affect how you approach the patient?

- Always (16)
- Most of the time (17)
- Rarely (18)
- Never (3)

Q7.11 Do you personally refer patients to psychosocial support services?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Block

Q7.12 Do you communicate your referral to others?

- Always (22)
- Most of the time (23)
- Rarely (24)
- Never (25)

If Never Is Selected, Then Skip To End of Block

Q7.13 Who do you communicate the referral to? Select all that apply.

- Patient (1)
- Patient's family or carer (2)
- Radiation Oncology Consultant or Trainee (3)
- Other Radiation Therapists (4)
- Radiation Nurse (5)
- Other (6)

Answer If Who do you communicate the referral to? Select all that apply. Other Is Selected

Q7.14 If other, please specify

Q7.15 How do you communicate the referral? Select all that apply.

- Written communication (Radiation therapy information systems e.g. ARIA, MOSAIQ; inpatient notes or email) (1)
- Verbal communication (2)
- Other (3)

Answer If How do you communicate the referral? Select all that apply. Other Is Selected

Q7.16 If other, please specify

Section 8 – Current work resources

Q8.1 Sometimes the environment in which we work, plays a role in our ability to interact with emotional patients. This can include the availability of physical, educational and supportive resources.

Q8.2 For the statements below, indicate the response that best matches your opinion.

	Agree (1)	Disagree (2)	I don't know (3)
I am too busy at work to provide support to emotional patients (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no time in the schedule to provide support to emotional patients (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often have to prioritise technical demands over support to emotional patients (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing treatment complexity has reduced the time available to provide support to emotional patients (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am too exhausted to provide support to emotional patients (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8.3 Consider your current workplace practices when providing answers to the following statement. Select all that apply. "When confronted with an emotional patient, I am able to....."

- Take them to a private room to talk (1)
- Talk with them inside the treatment room or control area (2)
- Call on another colleague to cover me while I speak with the patient (3)
- Refer the patient to someone else they can talk with (4)
- Other (5)

Answer If Consider your current workplace practices when providing answers to the following statement. Sele... Other Is Selected

Q8.4 If other, please specify.

Q8.5 For the statements below, indicate the response that best matches your opinion.

	Yes (1)	No (2)	I don't know (3)
I have enough time to fully communicate with emotional patients (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are sufficient radiation therapists to take over my duties while I communicate with an emotional patient (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are support services I can access to help an emotional patient (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am aware of how to access support services to help an emotional patient (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can go to my manager or supervisor for support when I care for an emotional patient (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can go to the patient's radiation oncologist for support when I care for an emotional patient (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have access to patient education materials to help support emotional patients (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are educational resources available to me to improve my ability to communicate with emotional patients (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are supportive resources available to me to help me deal with providing support to emotional patients (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My team supports me emotionally when I deal with emotional patients (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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## Section 9 – Work related stress

Q9.1 The following questions ask about your feelings and methods of coping with work related issues.

Q9.2 Have you ever used services to help deal with work related stresses of any kind? Types of services may include employee assistance programs, counsellor, debriefing services, G.P., psychologist, mental health services, etc.

- Yes (1)
- No (2)
- Prefer not to answer (3)

Answer If Have you ever used services to help deal with work related stresses of any kind?  
Types of service... Yes Is Selected

Q9.3 Please approximate when you last accessed these services.

- Within the last 12 months (1)
- 1 to 5 years ago (2)
- More than 5 years ago (3)
- Prefer not to answer (4)

Q9.4 As a radiation therapist, being a "helper" and assisting patients and families cope with cancer is part of your role. When you help people, you have direct contact with their lives. As you may have found, your compassion for those you help can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a "helper". Consider each of the following questions about you and your work situation. Select the option that honestly reflects how frequently you have experienced these things in the last 30 days. (If you are not currently working as a Radiation Therapist, reflect on how you felt in your last month of working as a Radiation Therapist).

	Very Often (1)	Often (2)	Sometimes (3)	Rarely (4)	Never (5)
I am happy (1)	<input type="radio"/>				
I am preoccupied with more than one person I help (2)	<input type="radio"/>				
I get satisfaction from being able to help people (3)	<input type="radio"/>				
I feel connected to others (4)	<input type="radio"/>				
I jump or am startled by unexpected sounds (5)	<input type="radio"/>				
I feel invigorated after working with those I help (6)	<input type="radio"/>				
I find it difficult to separate my personal life from my life as a helper (7)	<input type="radio"/>				
I am not as productive at work because I am losing	<input type="radio"/>				

<p>sleep over traumatic experiences of a person I help (8)</p> <p>I think that I might have been affected by the traumatic stress of those I help (9)</p> <p>I feel trapped by my job as a helper (10)</p> <p>Because of my helping I have felt "on edge" about various things (11)</p> <p>I like my work as a helper (12)</p> <p>I feel depressed because of the traumatic experiences of the people I help (13)</p> <p>I feel as though I am experiencing the trauma of someone I have helped (14)</p> <p>I have beliefs that sustain me (15)</p> <p>I am pleased how I am able to keep up with helping techniques</p>	<input type="radio"/>				
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and protocols (16)					
I am the person I always wanted to be (17)	<input type="radio"/>				
My work makes me feel satisfied (18)	<input type="radio"/>				
I feel worn out because of my work as a helper (19)	<input type="radio"/>				
I have happy thoughts and feelings about those I help and how I could help them (20)	<input type="radio"/>				
I feel overwhelmed because my work load seems endless (21)	<input type="radio"/>				
I believe I can make a difference through my work (22)	<input type="radio"/>				
I avoid certain activities or situations because they remind me of frightening experiences of the people I help (23)	<input type="radio"/>				
I am proud of what I can do to help (24)	<input type="radio"/>				
As a result of	<input type="radio"/>				

my helping I have intrusive, frightening thoughts (25)					
I feel "bogged down" by the system (26)	<input type="radio"/>				
I have thoughts that I am a "success" as a helper (27)	<input type="radio"/>				
I can't recall important parts of my work with trauma victims (28)	<input type="radio"/>				
I am a very caring person (29)	<input type="radio"/>				
I am happy that I chose to do this work (30)	<input type="radio"/>				

Q9.5 If these questions have raised concerns and you feel you may be suffering stress or burnout, please contact local services for support such as: your manager, employee assistance program representative, G.P., professional body, Lifeline or other group.

## Section 10 – Additional information – CPD and results dissemination

Q10.1 Do you have any other comments you would like to add?

- Yes (1)
- No (2)

Answer If Do you have any other comments you would like to add? Yes Is Selected

Q10.2 If yes, please specify.

Q10.3 Please remember, your survey responses will remain anonymous. Any details that you provide in the following questions will remain confidential. Your contact information will be extracted and stored separately to your survey responses.

Q10.4 What further involvement would you like to have after this survey? Select all that apply

- I want to claim CPD points for survey completion (1)
- I would like to receive the results of this study once completed (2)
- I am willing to be contacted in the future, to consider taking part in further work that results from this study (3)
- I do not wish to have any further involvement (4)

If I do not wish to have any f... Is Selected, Then Skip To End of Block

Answer If What further involvement would you like to have after this survey? (Select all that apply) I want to claim CPD points for survey completion Is Selected

Q10.5 Please enter your email address to receive an email to support your claim for CPD points. (If you do not find an email in your inbox, check your spam/junk mail)

Email address (1)

Answer If What further involvement would you like to have after this survey? (Select all that apply) I would like to receive the results of this study once completed Is Selected

Q10.6 Please enter your email address to receive results of this study.

Email address (1)

Answer If What further involvement would you like to have after this survey? (Select all that apply) I am willing to be contacted in the future, to consider taking part in further work that results from this study Is Selected And Which country are you working in? Australia Is Selected

Q10.7 Please enter the following details so that we may invite you to participate in further work resulting from this study.

First name (optional) (1)

Last name (optional) (2)

Phone number (AUS) (optional) (3)

Email address (11)

Answer If What further involvement would you like to have after this survey? (Select all that apply) I am willing to be contacted in the future, to consider taking part in further work that

results from this study Is Selected And Which country are you working in? New Zealand Is Selected

Q10.8 Please enter the following details so that we may invite you to participate in further work resulting from this study.

First name (optional) (1)

Last name (optional) (2)

Phone number (NZ) (optional) (3)

Email address (11)

Answer If What further involvement would you like to have after this survey? (Select all that apply) I am willing to be contacted in the future, to consider taking part in further work that results from this study Is Selected And Which country are you working in? Canada Is Selected

Q10.9 Please enter the following details so that we may invite you to participate in further work resulting from this study.

First name (optional) (1)

Last name (optional) (2)

Phone number (CA) (optional) (3)

Email address (11)

## APPENDIX 9. Survey completion by section i.e. respondent dropout

Section Number	Section Title	Number of respondents
1	Participant Information Statement (PIS)	n/a
2	Demographics	744
3	Communication Skills Training (CST)	684
4	Perceived values of radiation therapist interactions	667
5	Signs of anxiety	649
6	Vignette 1 - Alex	626
	Vignette 2 - Pat	602
7	Current Work Practices	602
8	Work Resources	592
9	Work Related Stresses	583
10	Additional information (optional)	n/a
Total	Completed surveys	583

## APPENDIX 10. Communication or emotional care training completed by country and training focus

Training completed	ANZ n=318	Canada n=264	Total n=582	p value
CST	197 (62.7%)	133 (51.2%)	330 (56.7%)	0.005
Emotional Cues	124 (39.6%)	94 (36.3%)	218 (37.5%)	0.415
Psychology	106 (33.7%)	68 (26.5%)	174 (30.0%)	0.063
Anxiety and Depression	76 (24.4%)	68 (26.5%)	144 (24.4%)	0.566
Counselling	64 (20.3%)	64 (24.9%)	128 (22.0%)	0.191
All of the above	33 (10.4%)	28 (10.6%)	61 (10.5%)	0.929
None of the above	86 (27.0%)	94 (35.6%)	180 (30.1%)	0.026
Other training	74 (23.3%)	48 (18.2%)	122 (21.0%)	n/a

Note: multiple responses per respondent. Missing data equals 57 respondents (9.8%). This included five non-responses and 52 uninterpretable/inconsistent responses i.e. respondents indicated they had not completed training, but provided a timeframe for training completion, and vice versa. 'Other' was selected by 172 respondents, 50 responses were excluded. The remaining respondents indicated 'other' training which included: psychosocial, clinical, palliative/grief, cultural awareness, conflict, and holistic care.

**APPENDIX 11. CST by country and timeframe**

CST completed	ANZ n=197	Canada n=133	Total n=330
Less than 1 year ago	44 (22.3%)	19 (14.3%)	63 (19.1%)
Between 1 and 5 years ago	93 (47.2%)	56 (42.1%)	149 (45.2%)
More than 5 years ago	60 (30.5%)	58 (43.6%)	118 (35.8%)

**APPENDIX 12. Perceived value of RT interactions with emotional patients (n=582)**

Item Number	Item	ANZ n=318			Canada n=264			Chi square p-value
		Agree	Don't Know	Disagree	Agree	Don't Know	Disagree	
4.2.1	Patient care and support is the main reason I entered this profession	231	18	69	212	14	38	0.070
4.2.2	My organisation (e.g. hospital, clinic) values my providing support to emotional patients	236	51	31	189	37	38	0.207
4.2.3	My work colleagues (other RTs) value my providing support to emotional patients	258	40	20	222	38	4	0.014
4.2.4	Other members of the healthcare team value my providing support to emotional patients	224	71	23	171	63	30	0.171
4.2.5	At my workplace it is expected that RTs provide support to emotional patients	242	27	49	211	22	31	0.430
4.2.6	The focus of radiation therapy should be on technical innovations rather than patient care	8	17	293	6	6	252	0.161
4.2.7	Emphasis on technical skills is driving recruitment and retention processes for RTs	173	77	68	114	88	62	0.017
4.2.8	My patients feel questions about the psychosocial aspects of their lives are irrelevant	18	65	235	23	64	177	0.149
4.2.9	A patient's family will reject the idea of RTs dealing with psychosocial issues	26	78	214	16	67	181	0.616
4.2.10	Patients are not open to RTs dealing with psychosocial issues	27	63	228	18	54	192	0.751

### APPENDIX 13. Categorisation of signs of anxiety

Category	Descriptions
Nervous/ Agitated	Afraid, scared, fearful, startled, wide eyed, erratic actions, fidgeting, jittery, jumpy, shaking, irritable, edgy, apprehensive, stressed, tense, unable to relax, unsettled, restless, worried.
Physiological reactions	Changes to breathing pattern, increased heart rate, palpitations, chest discomfort, nausea, vomiting, stomach pains, bowel changes, weight or appetite changes, dry mouth, headache, feeling faint, sweaty, clammy, red/flushed/pale face, dilated pupils, hot/cold flushes, urge to urinate, panic attack.
Withdrawn/ Avoidant	Late or not attending appointments, procrastinating/making excuses, unable to make eye contact or communicate, quiet, passive, distant, despondent, not engaged, closed body language.
Verbal	Overly chatty, talking fast, irregular control of voice volume, faltering voice, awkward chatter, nervous laughter, awkward jokes, asking and repeating questions, questions everything, interrupts responses, trying to gain control of conversation, not making sense, word jumbling, verbally states they are anxious.
Distracted	Unable to focus, concentrate, make decisions or follow instructions, short attention span, rapid/darting eyes, confused, forgetful.
Crying	Tearful, weeping.
Emotional	Sad, upset, clingy, frustrated, grumpy, distressed, emotional outbursts, moodiness, overreacting, overwhelmed, cannot cope, excessive worry, catastrophising, feeling loss of control, paranoia, claustrophobia, self-doubt.
Sleep Related	Changes to sleep habits, insomnia, interrupted sleep, tired, lethargy, exhausted, fatigue.
Angry	Abrupt, rude, short, aggressive, demanding, angry outbursts, yelling, argumentative, disagreeable, defensive, short tempered, cranky, annoyed, complaining.
Non-specific/ Uncodeable	Non-English words, non-specific or irrelevant traits/behaviours, words relating to co-workers.

**APPENDIX 14. Frequency of descriptors endorsed**

No. of descriptors endorsed	Vignette 1 (Alex) Respondents (n=582)	Vignette 2 (Pat) Respondents (n=582)
0	0 (0%)	0 (0%)
1	43 (7.4%)	19 (3.3%)
2	159 (27.3%)	52 (8.9%)
3	218 (37.5%)	170 (29.2%)
4	105 (18.0%)	250 (43.0%)
5	47 (8.1%)	62 (10.7%)
6	10 (1.7%)	28 (4.8%)
7	n/a	1 (0.2%)
Total	100%	100.1%

**APPENDIX 15. Frequency of indicators endorsed**

No. of indicators endorsed	Vignette 1 (Alex) Respondents (n=582)	Vignette 2 (Pat) Respondents (n=582)
0	42 (7.2%)	55 (9.5%)
1	16 (2.7%)	36 (6.2%)
2	70 (12.0%)	115 (19.8%)
3	139 (23.9%)	139 (23.9%)
4	177 (30.4%)	121 (20.8%)
5	138 (23.7%)	67 (11.5%)
6	n/a	49 (8.4%)
Total	100.0%	100.0%

**APPENDIX 16. Frequency of management strategies endorsed**

No. of management endorsed	Vignette 1 (Alex) Respondents (n=582)	Vignette 2 (Pat) Respondents (n=582)
0	2 (0.3%)	2 (0.3%)
1	131 (22.5%)	55 (9.5%)
2	232 (39.9%)	255 (43.8%)
3	172 (29.6%)	194 (33.3%)
4	42 (7.2%)	70 (12.0%)
5	3 (0.5%)	6 (1.0%)
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

**APPENDIX 17. Management strategies endorsed for anxious vs. not anxious patients**

Vignette	Descriptor	Management Strategy endorsed						Total
		Start ASAP	Referral	Acknowledge & encourage	RO/nurse	Friend/family in set-up	Other	
1 (Alex)	Anxious	82	285	548	118	232	50	552
	Not Anxious	1	11	28	2	8	0	29
	<b>Total</b>	83	296	576	120	240	50	581
2 (Pat)	Anxious	22	230	455	450	90	44	504
	Not Anxious	3	22	64	64	9	4	76
	<b>Total</b>	25	252	519	514	99	48	580