

**Development and Pilot testing of an Online ACT Intervention for Improving Psychological Outcomes and Quality of Life for Adults with Cancer.**

Hannah Cox

May 2022

*Research submitted in partial fulfilment of the requirements for the degree of Doctor in Clinical Psychology (DClinPsy), Royal Holloway, University of London.*

## Acknowledgements

A special thank you to Dr Michelle Taylor, for her dedicated support, expert knowledge, and considerate supervision. Thank you also to Dr Jess Kingston for helping to thoughtfully shape the project through her methodological comprehension and extensive ACT-based knowledge. Their kindness and encouragement throughout this project made this an inspiring and positive experience.

A huge thank you to the people who participated in the study and for the time spent providing considerate feedback on the intervention. I would also like to express my upmost gratitude to the team at Maggie's, Royal Marsden for all their help with recruitment.

I would like to thank my friends and family for bringing laughter and joy into even the most stressful times of doctoral training. Thank you to my mum, Sara, for her endless support which made planning a wedding and writing a thesis at the same time somehow possible. And I would like to thank my husband, James, for his understanding, for the countless cups of coffee during this process, and for enriching my life every day.

## Table of Contents

<b>ACKNOWLEDGEMENTS</b>	<b>2</b>
<b>I. LAY SUMMARY</b>	<b>6</b>
<b>II. A SYSTEMATIC REVIEW OF THE EFFECTIVENESS OF DIFFERENT PSYCHOLOGICAL INTERVENTIONS FOR QUALITY OF LIFE AND PSYCHOLOGICAL OUTCOMES AMONG PEOPLE LIVING WITH CANCER.</b>	<b>9</b>
<b>ABSTRACT</b>	<b>10</b>
<b>INTRODUCTION</b>	<b>11</b>
DEFINING CANCER	11
CANCER AND MENTAL HEALTH	11
<b>METHOD</b>	<b>16</b>
SEARCH STRATEGY	16
STUDY ELIGIBILITY CRITERIA	16
STUDY SELECTION	17
QUALITY ASSESSMENT	20
DATA EXTRACTION	20
DATA ANALYSES	21
<b>RESULTS</b>	<b>21</b>
STUDY CHARACTERISTICS	36
PARTICIPANT CHARACTERISTICS	37
STUDY RESULTS	39
QUALITY ASSESSMENT	58
<b>DISCUSSION</b>	<b>58</b>
EFFICACY ACROSS CANCER TYPES	61
EVALUATION OF THE CURRENT REVIEW	63
<b>CONCLUSIONS</b>	<b>64</b>
<b>III. WEB-BASED ACCEPTANCE AND COMMITMENT THERAPY FOR PEOPLE LIVING WITH CANCER. A PILOT STUDY USING SINGLE CASE EXPERIMENTAL DESIGN.</b>	<b>66</b>
<b>ABSTRACT</b>	<b>67</b>
<b>INTRODUCTION</b>	<b>68</b>
CANCER AND PSYCHOLOGICAL SUPPORT	68
ONLINE INTERVENTIONS	72
MEASUREMENT ISSUES AND ASSESSMENT OF QoL	73
AIMS OF THE PRESENT STUDY	74

<b>METHOD</b>	<b>75</b>
<b>MEASURES</b>	<b>78</b>
INTERVENTION DEVELOPMENT	81
PROCEDURE	83
DATA ANALYSIS	86
<b>RESULTS</b>	<b>89</b>
DEMOGRAPHICS AND CANCER CHARACTERISTICS	89
FEASIBILITY AND ACCEPTABILITY	90
IDIOPHIC RESULTS	91
STANDARDISED MEASURES	107
PROCESS RESULTS	109
<b>DISCUSSION</b>	<b>110</b>
PSYCHOLOGICAL OUTCOMES	111
PROCESS OUTCOMES	114
STRENGTHS AND LIMITATIONS	115
IMPLICATIONS AND RECOMMENDATIONS	117
CONCLUSIONS	119
<b>IV. IMPACT, INTEGRATION AND DISSEMINATION</b>	<b>120</b>
<b>INTEGRATION</b>	<b>120</b>
<b>IMPACT</b>	<b>127</b>
<b>DISSEMINATION</b>	<b>129</b>
<b>VI. APPENDICES</b>	<b>152</b>
<b>APPENDIX A</b>	<b>152</b>
ETHICAL APPROVAL FROM RESEARCH ETHICS COMMITTEE AT ROYAL HOLLOWAY, UNIVERSITY OF LONDON	
<b>APPENDIX B</b>	<b>153</b>
RECRUITMENT FLYER	153
<b>APPENDIX C</b>	<b>154</b>
PARTICIPANT INFORMATION SHEET	
<b>APPENDIX D</b>	<b>161</b>
CONSENT FORM	
<b>APPENDIX E</b>	<b>163</b>
SOCIO-DEMOGRAPHIC QUESTIONNAIRE	
<b>APPENDIX F</b>	<b>168</b>
HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS)	
<b>APPENDIX G</b>	<b>169</b>
MULTIDIMENSIONAL PSYCHOLOGICAL FLEXIBILITY INVENTORY (MPFI)	
<b>APPENDIX H</b>	<b>172</b>
THE CANCER DEPENDENT QUALITY OF LIFE (CANCERDQOL)	
<b>APPENDIX I</b>	<b>180</b>
IDIOPHIC MEASURES	
<b>APPENDIX J</b>	<b>182</b>
FEEDBACK QUESTIONS	

<b>APPENDIX K</b>	<b>185</b>
SCREENING QUESTION	
<b>APPENDIX L</b>	<b>186</b>
WEB-BASED ACT INTERVENTION PROTOCOL	
<b>APPENDIX M</b>	<b>210</b>
GENERAL PRACTITIONER PARTICIPATION LETTER	
<b>APPENDIX N</b>	<b>211</b>
REFERENCE DATA FOR RELIABLE CHANGE INDEX AND CLINICALLY SIGNIFICANT CHANGE CALCULATIONS	
<b>APPENDIX O</b>	<b>212</b>
ACCEPTABILITY DATA	
<b>APPENDIX P</b>	<b>215</b>
TAU-U DATA	
<b>APPENDIX Q</b>	<b>221</b>
STANDARDISED MEASURES DATA	
<b>APPENDIX R</b>	<b>223</b>
PROCESS MEASURE DATA	

### List of Figures

<b>FIGURE 1: PRISMA DIAGRAM</b>	<b>19</b>
<b>FIGURE 2: ACT “HEXAFLEX”</b>	<b>71</b>
<b>FIGURE 3: DIAGRAM ILLUSTRATING PARTICIPANT FLOW THROUGH THE STUDY</b>	<b>77</b>
<b>FIGURE 4: LINE MARKERS KEY</b>	<b>91</b>
<b>FIGURE 5: LOW MOOD VAS</b>	<b>93</b>
<b>FIGURE 6: ANXIETY VAS</b>	<b>96</b>
<b>FIGURE 7: PAIN VAS</b>	<b>99</b>
<b>FIGURE 8: FATIGUE VAS</b>	<b>102</b>
<b>FIGURE 9: MINDFULNESS VAS</b>	<b>105</b>
<b>FIGURE 10: ANXIETY AND DEPRESSION OVERALL SCORES (HADS)</b>	<b>108</b>
<b>FIGURE 11: CANCER DEPENDENT QUALITY OF LIFE SCORES</b>	<b>109</b>

### List of Tables

<b>TABLE 1: STUDY CHARACTERISTICS</b>	<b>22</b>
<b>TABLE 2: STUDY RESULTS</b>	<b>40</b>
<b>TABLE 3: QUALITY ASSESSMENT</b>	<b>57</b>
<b>TABLE 4: SOCIO-DEMOGRAPHIC AND CANCER CHARACTERISTICS</b>	<b>89</b>

## I. Lay summary

Living with cancer can have a detrimental impact on wellbeing and quality of life. Research has shown that people diagnosed with cancer are at heightened risk of mental health comorbidities such as depression. Due to medical advancements enhancing survivorship rates, cancer is increasingly considered to be a long-term condition. However, psychological difficulties continue to be under detected and insufficiently treated within the cancer population. Further, individuals seeking psychological support following a cancer diagnosis can face long wait times and may have to overcome various logistical and physiological barriers to access face to face treatment. One psychological approach which has been shown to demonstrate promising outcomes for people living with cancer is Acceptance and Commitment Therapy (abbreviated to “ACT”). ACT emphasises the healthy adaptation to challenging circumstances and supports individuals to live meaningfully alongside cancer related challenges. However, research looking at the effectiveness of ACT within oncology is relatively scarce compared to the more frequently utilised approaches of CBT and supportive counselling.

This systematic review (SR) of the literature sought to understand what the key components were of ACT-based approaches, and how face to face ACT, CBT and supportive counselling compare in terms of quality of life (QoL) and psychological outcomes such as anxiety and depression. Further, the SR planned to examine how intervention effectiveness may differ across diagnoses and stages. A third aim was to provide further clarity regarding what markers of change were being focused upon and what measures were being used to ascertain this information. To achieve these aims, electronic bases were searched for oncology-based studies that used either a CBT, supportive counselling, or ACT-based approach. Eligible studies focused on psychological outcomes and/or quality of life.

It was found that:

- ACT demonstrated encouraging findings across cancer types.
- ACT led to the largest improvements in psychological outcomes such as anxiety and depression when compared to CBT and supportive counselling.

- There was a high degree of variation across the studies in terms of what was being measured and how, which made meaningful comparisons difficult.
- All three intervention types were shown to lead to some beneficial gains in relation to psychological outcomes or QoL.

The experimental study sought to build upon the findings from the SR through recognising the potential effectiveness of ACT for people living with cancer and combining this with the potential advantages of web-based interventions within oncology. Online interventions have been shown to be effective in reducing psychological distress for people with long-term conditions and may heighten the accessibility of treatment for people living with cancer. The experimental study consisted of six participants who were experiencing distress following a cancer diagnosis. Participants were recruited through Maggie's Cancer Centre at the Royal Marsden and via social media. Prior to beginning the intervention, participants were randomly assigned to a waiting time of 1, 2 or 3 weeks. Participants were then invited to complete six modules, one per week, before beginning a four-week follow-up period. Whilst taking part in the study, participants completed daily questionnaires, and some additional questionnaires before the intervention began, post-intervention and at the end of the four-week follow-up period.

It was found that:

- Of the 11 people who consented to participate in the study, 55% (6 people) completed the intervention, suggesting that the web-based intervention was generally feasible for this sample.
- Participant feedback was largely positive with qualitative feedback that the intervention was informative, user-friendly, and particularly helpful in the earlier stages of diagnosis.
- Post-intervention, the daily measures of low mood and anxiety suggested that improvements occurred for half of the participants, these improvements were largely maintained at follow-up.
- Participants completed an additional symptom focused measure of depression and anxiety at four time points across the study. Five participants reported improvements in depression scores at follow-up, whilst two participants reported feeling less anxious.

- At follow-up, two participants reported being less bothered by physical pain and five participants reported being less bothered by fatigue.
- Improvements in mindfulness post-intervention and at follow-up were reported by all participants.
- Quality of life improvements were found for two participants post intervention and three at follow-up.
- Four participants improved in psychological flexibility post intervention and two at follow-up.

The findings of the SR and this study have shown ACT to be a promising intervention for people living with cancer, which can lead to psychological improvements such as low mood and noticeable improvements in quality of life. These encouraging results will hopefully be of interest to clinicians working within oncology when considering which therapeutic approach to adopt. Further, it is hoped that these preliminary findings will encourage further research into the effectiveness of web-based ACT for people living with cancer. Being able to offer effective online psychological support could be of value at times when face to face support is not available or when physically attending in person would be challenging.

Future studies are likely to benefit from recruiting more participants and from addressing the limitations identified by this study. To ensure that the findings reach a wide audience, they will be shared with participants, with Maggie's Cancer Centres across the UK, within cancer support groups on social media, presented at conferences and published in a scientific journal.



## **II. A Systematic Review of the Effectiveness of Different Psychological Interventions for Quality of Life and Psychological Outcomes among People Living with Cancer.**

## **Abstract**

A cancer diagnosis can have a substantial impact on an individual's mental health, with psychiatric comorbidities such as anxiety and depression frequently cited. Mental health difficulties within the oncology population are recognised to be under detected and under treated. One relatively novel therapeutic approach thought to hold promise for people living with cancer is Acceptance and Commitment Therapy (ACT). ACT is proposed to be conceptually well suited to meet the needs of cancer patients, yet no systematic reviews have pulled the literature together to compare the approach to the more frequently utilised approaches of CBT and supportive counselling. Further, within the oncology literature there is recognised to be vast heterogeneity in terms of what outcomes are focused upon and how they are measured. This review sought to explore the effectiveness of CBT, supportive counselling, and ACT in relation to psychological outcomes and QoL. Additionally, it was hoped that bringing the evidence together in this way would help to provide clarity on the key components of ACT-based interventions within oncology, the outcomes being focused upon, and the measures being used. Systematic searches of three databases were conducted: PubMed, PsychINFO and Web of Science. Additionally, grey literature and reference lists were reviewed. Studies eligible for inclusion were written in English, utilised an ACT, CBT or supportive counselling in person approach, and quantitatively assessed psychological or quality of life-based outcomes in adults living with cancer. Title, abstract and full text screening resulted in ten papers satisfying the inclusion criteria. This review found all three intervention types to be able to offer some beneficial gains in relation to psychological measures or QoL. The largest effect sizes in this regard were seen for the ACT-based interventions with benefits found across cancer types and stages. Substantial heterogeneity across included studies in terms of design, measures, and methodological quality made meaningful comparisons between interventions difficult. These findings suggest that ACT can offer several psychological benefits for people living with cancer, however more high-quality research is needed. Future research would benefit from addressing the highlighted methodological limitations found within this review. Greater consensus over the outcomes being used and the adoption of cancer-specific outcome measures where possible is advised.

## **Introduction**

### **Defining Cancer**

Cancer is responsible for one in eight deaths globally with incidence rates predicted to rise due to factors such as aging populations, physical inactivity, and poor diet (Torre et al., 2015; Sung et al., 2021). Stemming from abnormal proliferation of the different cells within the body, cancers are malignant tumours of which there are more than a hundred types. Each type can present with different trajectories and treatment amenability (Cooper, 2004). Cancer can be particularly difficult to cure due to its metastatic nature, the process through which cancerous cells spread to different parts of the body. Metastasis, accompanied with the asymptomatic nature of some cancers, makes effective medical intervention particularly challenging (Chakraborty & Rahman, 2012). Within England alone, there were 327,174 cancer diagnoses registered in 2019, which equates to a daily average of 896 cases and represents a rise in yearly cases of 3,724 from 2018 (Cancer Registration Statistics England, 2021). However, whilst incidence rates are rising, medical advancements mean that survivorship rates continue to increase (Miller et al., 2019) and have more than doubled over the last forty years in the UK (Cancer Research UK, 2018). Resultantly, cancer is increasingly considered a long-term condition.

### **Cancer and Mental Health**

Notwithstanding medical advancements, a cancer diagnosis still often poses substantial threat to life and the possibility of physical indisposition (Torre et al., 2015). Further, the risk of subsequent psychological distress is well recognised within the literature (Kwak et al., 2013). Post diagnosis, individuals are often faced with uncertain prognoses, the possibility or certainty of resultant death, and the side effects from toxic or scarring treatments (Niedzwiedz et al., 2019). It is therefore perhaps unsurprising that over 35% of patients report significant levels of sadness, worry and anger (Zabora et al., 2001). Additionally, whilst the risk of psychological distress is well recognised (Kwak et al., 2013), the individual factors likely to interact and influence the distress continue to be poorly understood, with scope for further research (Pitman et al., 2018). Many of these risk factors within the oncology population are likely to be comparable to those in the general population, such as demographic factors and social support (Wen et al.,

2018). However, additional unique structural factors such as healthcare access and welfare support are likely to increase the risk of psychological comorbidities, including anxiety and depression (Gilligan et al., 2018). Further, this risk remains for years post diagnosis, despite treatment potentially having been completed (Bultz & Carlson 2006). Recognition of this risk has resulted in the development of clinical practice guidance advising on the screening, management, and intervention of distress, in the hope that treatment may be ascertained as efficiently and effectively as possible (Holland et al., 2013). The potential long-term psychological impact from cancer is also reflected in the NHS 10-year plan which aims to prioritise a follow-up approach through which quality of life (QoL) will be tracked as a primary outcome (NHS England, 2021).

In addition to the potentially detrimental impact on psychological functioning, research suggests untreated psychiatric comorbidities in patients with cancer can substantially impact upon QoL (Nayak et al., 2013) and that this often worsens over time without adequate treatment (Bringmann et al., 2008). Defining and measuring QoL is not without challenge however, and there have been considerable measurement disputes (Bradley, 2001; Moschopoulou et al., 2021). These disputes range from conceptual clarity to viability of measurement (Hunt, 1997). Whilst several well validated and extensively used measures of health related QoL exist, these have been criticised for predominantly focusing on physical symptoms associated with the functional effects of treatment, as opposed to psychosocial issues (Moschopoulou et al., 2021). Further, it is often the case that symptoms can relate to other comorbid health conditions, with one study finding that comorbidity explained a greater proportion of variance in health related QoL than cancer characteristics (Vissers et al., 2013). This conflation of QoL and health status fails to recognise that the two concepts, although related, are distinct (Bradley, 2001; Lin et al., 2013). Additionally, QoL measurements have been criticised for failing to consider the individualised nature of QoL (Joyce, 1994) and further still, the potentially positive changes that can follow the experience of cancer (Shand et al., 2015).

Understanding the prevalence of psychological difficulties within this population is of utmost importance. Whilst research suggests that as many as a third of people will go on to develop mental health

comorbidities such as depression (Singer et al., 2010), the prevalence varies substantially within the literature. This variation has been proposed to stem, at least in part, from a lack of consensus as to what measures to use when trying to assess psychological functioning (Niedzwiedz et al., 2019). Resultantly, an assortment of generic measures may be used across studies whilst all trying to assess the same psychological concept. This variation may explain a proportion of the differences found between groups. For example, certain subgroups of people living with cancer have been identified as being at heightened risk of ongoing psychological difficulties, particularly anxiety and depression (Honda et al., 2005). Those who have been recently diagnosed, younger patients and patients with lung, pancreatic, breast and head and neck cancers are thought to be at particular risk of enduring distress (Massie, 2004). This distress is thought to arise not due to the cancer itself, but due primarily to the treatment and associated side effects. The invasive and intensive nature of typical cancer treatments, such as surgery, chemotherapy or hormone therapies typically impact upon the whole body (Foster et al., 2009). Relatedly, different treatment types have been found to have differing impacts on wellbeing, with some treatments such as chemotherapy thought to potentially induce depression through biological mechanisms (Ismail et al., 2017).

## **Psychological Treatment**

Screening for psychological distress within oncology settings is only of value if it leads to effective treatment (Niedzwiedz, 2019). Whilst the potential impact on psychological functioning is well documented (Kwak et al., 2013), Walker et al. (2014) found that psychological difficulties continue to be under detected and undertreated within the cancer population. One of the reasons for this under detection is thought to be due to the somatic symptoms of anxiety and depression being incorrectly attributed to cancer. Further, normalisation of distress within the context of oncology may leave patients feeling unable to disclose mental health difficulties due to stigma (Kissane, 2007).

When compared to the monitoring of physical health symptoms, the psychological needs of cancer patients continue to receive relatively modest attention (Niedzwiedz, 2019). Additionally, the psychological support that is available can take various forms and continues to be experienced by many as inadequate (MacMillan, 2015). Conventionally, psychological support within oncology has comprised of non-directive

supportive counselling (Jevane et al., 1998; Moorey, 1998; Ochoa et al., 2017) and cognitive behavioural therapy (CBT) based approaches (Duncan et al., 2017). Effectiveness based studies have found extensive methodological and intervention heterogeneity across psychological interventions (Guarino et al., 2020).

Supportive expressive approaches are often considered the most frequently used psychotherapeutic modality, seeking to increase social support, emotional expression and provide a space to explore existential concerns (Ho et al., 2016). As an approach, supportive therapy is considered an active treatment which has been shown to be effective in decreasing symptoms of anxiety and depression and improving QoL in individuals with breast cancer (Kisane et al., 2007). Mukherjee et al. (2017) additionally found supportive counselling (SC) to have a positive impact on self-reported QoL amongst female cancer patients. Relatively few studies have however looked at SC on an individual basis, with the approach being frequently utilised within group-based sessions. Further, the diverse nature of the therapy can make it difficult to review its effectiveness across treatment programmes (Newell et al., 2002). This is additionally compounded by methodological weaknesses and a lack of validated assessment tools (Edelman et al., 2000). Greater understanding of the key components, and how these compare to other treatment approaches, particularly when delivered in an individual format, would therefore be advantageous.

CBT is arguably the most frequently used approach to support psychological distress within oncology and focuses on improving affective state through altering maladaptive cognitive schemas (Ye et al., 2018). Osborn et al. (2006) found CBT to have significant advantageous effects on cancer survivors' anxiety and depression. However, there are contradictions within the research literature; Greer et al. (2010) found that traditional CBT does not sufficiently address distressing thoughts that may be rational yet intrusive. In addition, the impact on QoL has been disputed, Zhang et al. (2017) failed to demonstrate significant QoL improvements amongst women with breast cancer, whilst other studies have found CBT to have a beneficial impact (Lee et al., 2011; Ye et al., 2018). Several factors have been proposed to associate with differential responses to CBT, such as the cause of the distress and marital status (Button et al., 2012).

An alternative approach, which is increasingly utilised within oncology and has a growing evidence base is Acceptance and Commitment Therapy (ACT). Emphasising the healthy adaptation to challenging

circumstances, ACT is proposed to be conceptually well matched to the needs of cancer patients (Hulbert-Williams & Wilson, 2014). Despite limited published research, a narrative review that looked at empirical studies within ACT and oncology highlighted encouraging outcomes in terms of psychological flexibility and QoL (Fashler et al., 2018). Additionally, González-Fernández and Fernández-Rodríguez (2019) found ACT to be a promising intervention. The benefits of ACT in relation to some of the common concerns shared amongst cancer survivors have been tentatively commended within a recent review (Mathew et al., 2021). The use of limited outcome measures, study heterogeneity and low study quality constrains the conclusions that can be drawn from ACT-based generally (Linardon et al., 2018; Ost, 2014). Across the three treatment approaches (Supportive counselling, ACT and CBT), CBT is considered within the literature to be the most empirically supported intervention framework at present, however this may be due to other intervention types not being able to currently match CBT, in terms of research funding and trial numbers (Hulbert-Williams et al., 2018).

Research suggests that psychological interventions may help people living with cancer in a range of different ways, with improvements in emotional adjustment, QoL and coping skills all having been previously cited (Newell et al., 2002). Further, evidence suggests psychological therapy may prolong cancer survival times due to supporting patients to adapt and relate differently to their cancer diagnosis (Cunningham & Watson, 2004). However, within this population, a systematic review exploring the effectiveness of CBT, supportive counselling, and ACT in relation to psychological measures and QoL has not been conducted. Bringing the evidence together in this way will help to understand the effectiveness of the traditionally utilised psychological interventions of supportive counselling and CBT, and additionally the less routinely utilised approach of ACT. Understanding in what way the interventions are effective and for whom, is of particular importance given the potential risks associated with poorly treated psychological difficulties (Mukherjee et al., 2017). Within the literature, there is recognised to be a high level of heterogeneity in terms of study designs, outcomes, and intervention components. In addition to exploring intervention effectiveness, it is hoped that bringing the literature together in this way will also help to shed

light on the key intervention characteristics, the measures that are being routinely used to assess for improvements in psychosocial functioning and upon what grounds measures are being omitted.

## **Method**

### **Search Strategy**

Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA; Moher et al., 2009) guidelines informed the review process. A protocol to steer the procedure and research strategy was initially devised. Miller & Forest's (2001) 'PICO' tool was utilised to aid the development of the research question which stipulates that the following components should be considered: population, intervention, comparison, and outcomes.

The search terms grew out of considering the key areas of the research question and conducting initial scoping searches. These terms were subsequently reviewed and refined through discussions with the Royal Holloway, University of London librarian with expertise in systematic reviews. The search was conducted using three electronic databases; PubMed, Web of Science and Psych Info in November 2021. Whilst the definitions of the search fields vary across databases, the searches were essentially applied to 'titles', 'abstracts' and 'keywords'. The following search terms were used: ('Cancer' OR 'tumour' OR 'neoplasm' OR 'oncology') AND ('Acceptance and commitment therapy' OR "ACT" OR 'Cognitive behavioural therapy' OR "CBT" OR 'supportive counselling' OR 'supportive psychotherapy') AND (Intervention OR RCT OR 'clinical trial') AND (Adults) AND 'Quality of life' OR "QOL" OR wellbeing OR depression OR anxiety OR stress) NOT (review OR group OR protocol OR adolescent OR child OR 'meta-analysis' OR online).

### **Study Eligibility Criteria**

To be included, studies were required to meet the following inclusion criteria:

- a) Have samples of adults aged 18 or over who have either completed or are in the process of completing treatment for cancer.



- b) Include an ACT (Hayes, 2004), CBT or supportive counselling-based intervention applied to the target population. Eligible interventions took place face to face and on an individual basis (i.e., group-based, and online interventions were not eligible). For ACT-based studies, eligible interventions explicitly used an ACT component such as cognitive fusion or psychological flexibility (Hayes, 2004). Studies of interventions which were not defined within an ACT framework (e.g. a mindfulness intervention) or augmented ACT with other approaches (e.g. ACT and sleep hygiene) were excluded.
- c) Assess psychological outcomes and/or quality of life using standardised measures.
- d) Have a quantitative design with assessment at pre-post intervention. Intervention length and duration of individual sessions were permitted to differ across studies. Additionally, variation was permitted in relation to length of follow-up and intervention comparators, with studies without a comparison or control group eligible for inclusion. Reviews and case studies did not meet eligibility.
- e) Be available in English.

Studies were excluded if they did not satisfy the above inclusion criteria, such as qualitative studies, systematic reviews, meta-analyses, study protocols; studies where the target population was under the age of 18; studies of carers and/or family members of people living with cancer; studies examining interventions that did not use an ACT, supportive counselling-based or CBT approach.

## **Study Selection**

All searches utilised the 'Advance Search' function with no restrictive filters applied in terms of language and publication dates. PubMed and Web of Science were searched via the "in all fields" option whilst psycINFO was searched using the equivalent option of "in all text". All identified studies were exported to Refworks ProQuest reference management software. To diminish publication bias and ascertain any other additional eligible studies, hand searchers outside of the databases took place in January 2022. These hand searches were conducted through the following: reference lists of eligible studies; unpublished dissertations; research registers such as, Clinical Trials.gov; theses and reports, including ProQuest Dissertations & Thesis Global; published studies listed on the Association of Contextual

Behavioural Science website (<https://contextualscience.org/>); and the publication list of Dr. Steven C. Hayes on [www.stevenchayes.com/literature/publications](http://www.stevenchayes.com/literature/publications).

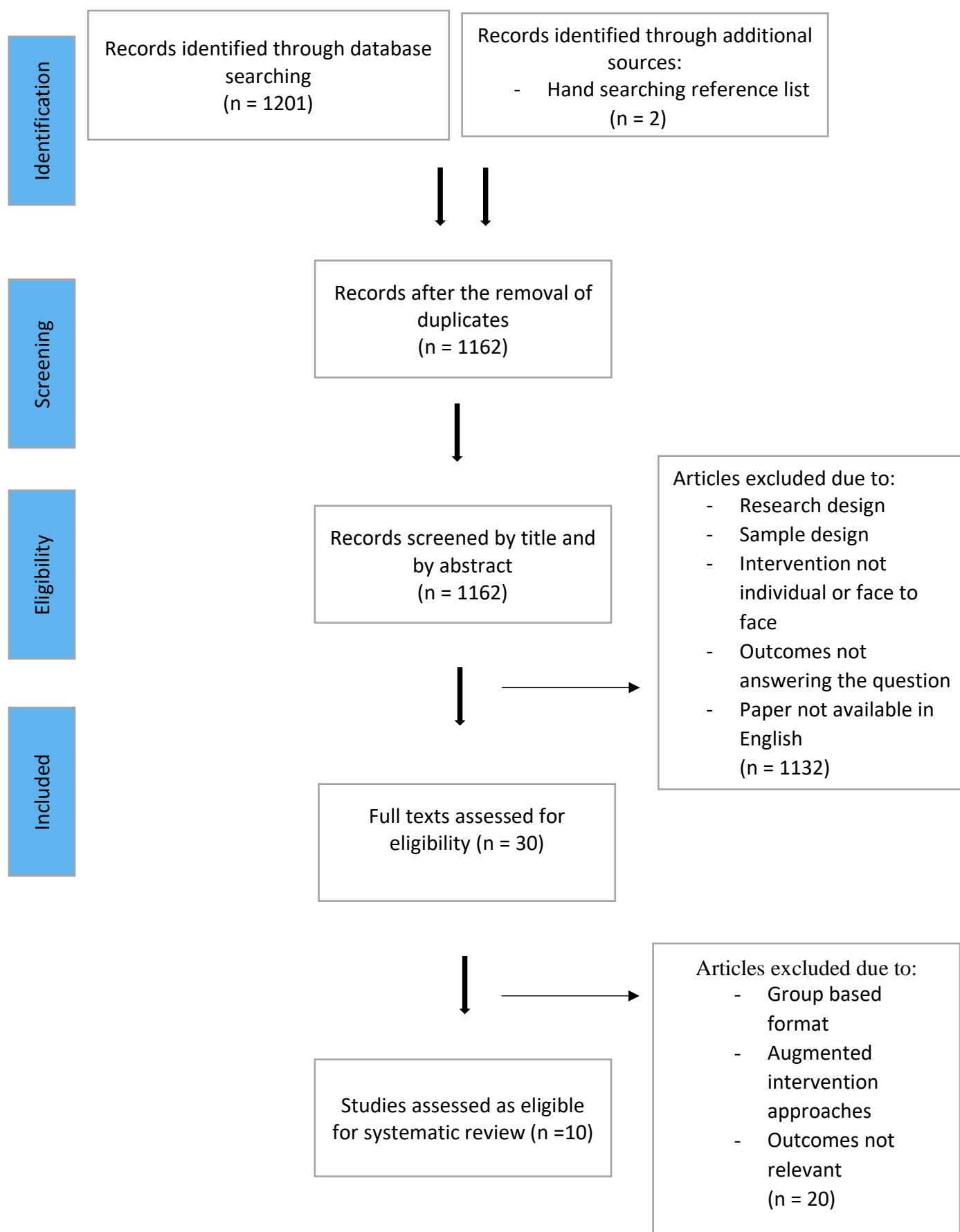
Figure 1 presents the process through which studies were deemed eligible and selected. A total of 1201 references were retrieved from PubMed ( $N = 877$ ), PsychINFO ( $n=158$ ) and Web of Science ( $n = 166$ ). Two additional studies were identified through hand searching the reference lists of eligible articles. After the removal of duplicate studies, 1162 articles remained and were exported to Microsoft Excel.

The abstracts of these remaining studies were screened against the eligibility criteria by the primary investigator and 1132 articles were excluded due to not meeting the inclusion criteria. The full texts of the remaining 30 articles were screened against the eligibility criteria with 20 subsequently being excluded. Exclusion occurred due to the following factors: intervention not solely face to face ( $n = 4$ ), intervention not delivered on an individual basis ( $n = 5$ ), outcomes not relevant to answer the review question ( $n=5$ ), outcome measures not validated ( $n = 3$ ), not available in English ( $n = 1$ ), ACT intervention augmented ( $n = 2$ ). Ten papers satisfied the eligibility criteria and were included in the data synthesis.

An independent reviewer screened the abstracts of 20% of the original 1201 studies against the eligibility criteria and a further 10% of the full-text papers. There was a percentage agreement of 83%,  $K = .829$  and 72%,  $K = .724$  respectively. Any discrepancies over inclusion were discussed and subsequently resolved.

**Figure 1**

*PRISMA diagram*



## Quality Assessment

Included articles were assessed by the author in terms of quality and potential risk of bias through use of the Quality Assessment Tool for Quantitative Studies developed by the Effective Public Health Practice Project (EPHPP; Thomas et al., 2004). The EPHPP is commonly utilised to appraise quantitative studies within the public health sector and has shown strong content validity and test-retest reliability (Thomas et al., 2004). The tool comprises of eight domains: selection bias; study design; confounders; blinding; data collection methods; withdrawals and dropouts, intervention integrity and analyses. A rating of 'weak', 'moderate' or 'strong' is allocated for six of the eight domains, resulting in a global quality rating for the overall study (see Table 3). A study is of 'weak' quality if two or more 'weak' ratings are acquired. Moderate studies will have acquired one 'weak' rating whilst a global score of 'strong' is given to studies without any 'weak' scores.

Ten percent of included studies were quality assessed independently by a second reviewer. Interrater concordance was 72% (Cohen's  $\kappa = .724$ ) suggesting good interrater reliability. Any disagreements over ratings were resolved through discussion.

## Data Extraction

For each eligible study, the following data was extracted: (a) details relating to publication: first author, year of publication, country; (b) study characteristics: design, conditions, number of participants in each condition, inclusion criteria, completion rates, recruitment strategy; (c) participant characteristics; age (mean, SD and range), gender, cancer type and stage, time since diagnosis, prognosis; (d) intervention: format, therapeutic approach, facilitator, participant adherence, number, and duration of sessions; measures: primary and secondary outcomes, standardised measures used, time points of data collection; (f) findings: post-intervention effectiveness and the effectiveness at follow-up, in terms of reported statistical significance and effect sizes.

## **Data Analyses**

The diversity of included studies in terms of design, comparators and outcome measures meant that the conditions for quantitative analysis were not satisfied and subsequently a meta-analysis was not viable (Boland et al., 2017). The data from included studies was subsequently synthesised narratively as per the Centre for Reviews and Dissemination (2009) guidance. Extracted data was reported in line with the PRISMA checklist (Moher et al., 2009). Statistical significance (p) and effect sizes (ES), as per Cohen's d (Cohen, 1988), were reported and examined. In instances where ES were not provided by the author, this was calculated when provided data permitted. To compare across studies and account for smaller sample sizes, Hedge's g (2012) was calculated. If not provided by the author, both Cohen's d and Hedge's g were calculated using an excel tool founded by Beckham (2016).

## **Results**

Ten studies satisfied the eligibility criteria and were subsequently included for narrative synthesis. Table 1 presents the main characteristics of the included studies, categorised by therapeutic approach (CBT, ACT, and supportive approaches).

**Table 1***Study Characteristics*

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
<b>CBT</b>	<i>N</i> =230	Breast 15%	Face to face CBT sessions.	185 / 230
Serfaty, 2019	66%	Colorectal/GI 7.3%		
	<i>M</i> =59.5, <i>SD</i> =12.4, range=27-93.	Lung 6.9% Haematological 8.2 %	Manualised sessions.	<sup>a</sup> 80%
UK	Adults ≥ 18 with advanced cancer not amenable to cure, a diagnosis of depressive disorder using the Mini-International Neuropsychiatric Interview and eligible for treatment in an IAPT centre with an estimated survival of greater than 4 months.	Hepato Pancreatic Biliary (HPB) 9.8% Neurological 16.9%	Socialisation to the CBT model, formulation, thought challenging, developing new coping strategies, problem solving, relapse prevention.  12 individual sessions of 60-minute duration, one per week.  Sessions were facilitated by high-level British Association for Behavioural and Cognitive	

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
<b>CBT</b> Dalton, 2004  USA	Recruited through oncology centres, general practitioner practices, a local hospice and through self-referral.		Psychotherapies-accredited IAPT therapist.	
	<i>N</i> =131 72% <i>M</i> =52, <i>SD</i> =NR, range=NR	Breast 41% Colon 8% Lung 12% Lymphoma 9% Other 30%	36/115 completed all sessions (31.3%) Face to face CBT sessions.	28/131  <sup>a</sup> 21.37%
	Adults ≥ 18 experiencing cancer-related chronic pain associated with disease progression.	Therapist-rated stage of disease: (0 = early, 10 = advanced)	Understanding maintenance cycles, relationship between pain and suffering, imagery or distraction, social reinforcement, and positive self-statements, cognitive restructuring.	
	No prior psychiatric history or having previously received CBT.	0–2.5: 11% 2.6–5.0: 19% 5.1–7.5: 28% 7.6–10.0: 42%		

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
			5 individual sessions of 50 minutes duration, one per week.	
			Delivered by registered nurses trained to implement the specific treatment.	
			17/47 completed all sessions (36.17%).	
<b>CBT and Supportive approaches</b> Kangas, 2012	<i>N</i> =35	Head and Neck cancer (100%)	1) Face to face Individual CBT sessions.	18/35
Australia	20%			<sup>a</sup> 51.43%
	<i>M</i> =58, <i>SD</i> =NR, range=NR		Psychoeducation pertaining to HNC and illness-related stress, breathing and relaxation training, imaginal exposure to distressing cancer-related memories,	
	Adults≥18-70 diagnosed with first onset HNC. Experiencing psychological distress as			



First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
	indicated by any of the following: $\geq 2$ symptom clusters as per the clinician administered PTSD scale; $\geq 14$ on the BDI-II; full criteria for MDD as assessed by the SCID-DSM-IV; $\geq 60$ on the STAI; satisfying full criteria on the SCID-DSM-IV, Anxiety module.  Recruited following referral to a local hospital.		graded in vivo exposure; cognitive restructuring, behavioural activity scheduling and relapse prevention.  Six individual sessions of 90 minutes on a weekly basis for six weeks, with an additional 7 <sup>th</sup> booster session.  76% attended all CBT sessions ( $N=21$ )  Facilitated by a master's level psychology student.  2)Face to face supportive counselling sessions.	

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
<b>Supportive Approaches</b>	<i>N</i> =134 100% <i>M</i> =52.7, <i>SD</i> =10.3, range=28-85.	Breast cancer 100% stage <III (91%) stage IV (9%)	Psychoeducation about HNC; Expressing current concerns; and problem-solving.	
			6 Individual sessions of 90 minutes duration, one per week with an additional 7 <sup>th</sup> booster session.	
			Facilitated by a master's level psychology student.	
			71% completed all SC sessions ( <i>N</i> = 10)	
Blanco, 2019			Face to face supportive counselling.	73 / 134 54%
USA			Clarification, suggestions, praise, reassurance,	

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
	Adults ≥ 18 with breast cancer of any stage and a current diagnosis of non-psychotic depression based on the Structured Clinical Interview for DSM-IV (SCID).  Recruited through clinician referral, advertisement, and patient advocacy organizations.		normalisation, rehearsal, anticipation, and strength focused approach.  12 Individual sessions of 45 minutes. Facilitated on a weekly basis.  Psychologists, psychiatrists, or social workers. Weekly supervision provided by experts to ensure adherence and competence	26/45 completed all sessions (57.78%).

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
<b><i>Supportive Approaches</i></b> Manne, 2017 USA	<i>N</i> =353  100%  <i>M</i> =50, <i>SD</i> =11.35, range=NR.  Adults≥18 diagnosed with primary gynaecological cancer with a Karnofsky Performance Status of > 80 or an Eastern Cooperative Oncology Group (ECOG) score of 0 or 1. Participants were on active treatment or were less than 3 months post-surgery.	Ovarian 81.3% Endometrial 6.5% Cervical 3.1% Vulvar .6% Vaginal .6% Fallopian tube .6% Uterine cancer 1.1%	Face to face supportive counselling.  Conversational in style. Reflection, empathy, encouragement, reassurance, validation, clarification, and exploration. Emotional expression, supporting existing coping behaviours, self-esteem, and autonomy. The therapist was nondirective and noninterpretive. Focus on discussing reactions rather than skills.  Six individual sessions of 60 minutes duration, one per	227/352 64.3%

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
	Recruited through local community hospitals and cancer centres.		week with an additional booster session one week after the sixth session.  Facilitated by social workers or psychologists who underwent prior training in the modality and utilised the manual for support.  99/120 completed all SC sessions (82.5%)	
<b>Supportive Approaches</b> Moorey, 1998 UK	<i>N</i> =57  74%  <i>M</i> =51, <i>SD</i> =13.35, range = 18- 74	Breast 47% Colorectal 9% Lymphoma 11% Prostate 4% Gynaecological 4% Teratoma 6% Astrocytoma 6%	Face to face supportive counselling  Non-directive techniques to support ventilation of feelings in an empathic therapeutic relationship.	<i>N</i> = 47/57 82.5%

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
	Adults ≥ 18 diagnosed with cancer at any stage demonstrating difficulties adjusting to their diagnosis or it's treatment as per the DSM III R criteria for adjustment disorder (American Psychiatric Association, 1987). Participants were eligible if they scored ≥ 8 on the Hospital Anxiety and Depression Scale.  Recruited through the Royal Marsden Hospital.	Other 11%	Guided by the requests and needs of the patient. Information provided regarding cancer and emotional reactions to cancer. Sessions were unstructured with no agenda and no formal problem-solving. Behavioural and cognitive techniques were not used, no homework assignments between sessions  8 individual sessions occurring on a weekly basis, with spouses joining some sessions where appropriate.	

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
			Intervention completion rate = NR.	
<b>Supportive Approaches</b>	<i>N</i> =120	Breast (26.1%), Colon	Face to face individual	78/120
Breitbart, 2012.	60.5%	(16.0%), Pancreatic (9.2%),	meaning centred	65%
USA	<i>M</i> =54.5, <i>SD</i> =11.6, range = 25 to 82.	Ovarian (8.4%), Lung (3.4%).	psychotherapy (IMCP)	
	Adults ≥ 18 with a diagnosis of stage III or IV solid tumour cancers or non-Hodgkin's lymphoma with a Karnofsky performance scores (physical functioning) ≥50.	All patients had either stage III (33.3%) or stage IV (66.7%) disease.	Manualised approach seeking to assist patients in enhancing a sense of meaning, peace, and purpose in their lives as they face limitations due to progression of disease and treatment. Psychoeducation, experiential exercises, and psychotherapeutic techniques (e.g., reflection, clarification, and exploration)	
	Participants were recruited from local outpatient clinics.			

First author, Year, Country	Sample characteristics	Cancer type and stage	Intervention Characteristics	Study Completion Rate
	% Female Age ( <i>M</i> , <i>SD</i> , Range)		(Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	
			that promote the use of sources of meaning as resources in coping with advanced cancer.	
			Individual sessions of 60 minutes duration occurring on a weekly basis for seven weeks.	
			Sessions were conducted by either a Clinical Psychologist or psychology doctoral students, all of whom received extensive training before treating patients.	
			41/64 completed all IMCP sessions (64%)	



First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
<b>ACT</b> Rost, 2012 USA	<i>N</i> =47 100% <i>M</i> =56, <i>SD</i> =NR, range = 32 – 74.  Adults ≥ 18 with stage III or IV ovarian cancer recruited at a local outpatient oncology clinic.	Ovarian cancer 100%	Face to face ACT sessions.  Sessional content followed a scripted protocol with observance to the protocol monitored.  Sessions were delivered by a Ph.D. level clinical psychologist and supervision was provided.  12 individual sessions for one hour over a four-month period.	31 / 47  64%
<b>ACT</b> Feros, 2013 Australia	<i>N</i> =45 75.6%	Breast (48.9%),	Face to face ACT sessions.	28 / 45 62%

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
	<i>M</i> =51.8, <i>SD</i> =NR, range = 25-77.  Adults ≥ 18 with a cancer diagnosis recruited through a local outpatient clinic.	Genitourinary, head and neck, lymphoma, lung, and stomach (51.1%)	Awareness of distressing thoughts and feelings, mindfulness, separating sense of self from the distressing thoughts and feelings, value-based work. The core elements of ACT were present in every session. Every session also encouraged committed action.  Individual sessions of 45 minutes duration occurring on a weekly basis for nine weeks.  28/45 completed all sessions (62%)	

First author, Year, Country	Sample characteristics % Female Age ( <i>M</i> , <i>SD</i> , Range)	Cancer type and stage	Intervention Characteristics (Format, Components, Duration/Number of Sessions, Delivery Provider, Adherence)	Study Completion Rate
<b>ACT</b>	<i>N</i> =54	Breast cancer or ductal	Individual ACT-based	54/62
Hadlandsmyth,	100%	carcinoma in situ (DCIS)	session.	87.1%
2019	<i>M</i> =52.91, <i>SD</i> =11.80, range=NR.	(100%)	Values, mindfulness, differentiating thoughts from behaviour, acceptance, cognitive defusion exercises, and committed action.	
USA	Adults ≥ 18 with a cancer diagnosis scheduled for mastectomy or lumpectomy for breast cancer or DCIS, and at risk of post-surgical pain. Participants were recruited through a local outpatient breast cancer clinic.		One session of 120 minutes attended 2 weeks post- surgery.  54 out of 62 recruited attended the session (87.1%)	

*Note.* <sup>a</sup>Calculated based on information in full-text article.

*Key.* CBT = Cognitive behavioural therapy; ACT=Acceptance and Commitment Therapy; Adherence=completion of all sessions; SC = Supportive Counselling; IMCP = Individual Meaning Centred Psychotherapy; HPB = Hepato Pancreatic Biliary; NR=Not Reported.

## Study Characteristics

Included studies were published between the years of 1998 and 2019 and were conducted in the USA (n = 6), Australia (n = 2) and the UK (n = 2). Three therapeutic approaches were represented across the studies: CBT (n = 4), ACT (n = 3) and supportive counselling-based approaches (n = 3). The study designs are presented in Table 2: pre-test post-test experimental design (n = 1), two-armed RCT (n = 6), three-armed RCT (n=3). Three of these studies were described as pilot studies. One study had three experimental groups and three studies had two experimental groups. Two of the studies had two experimental groups and an additional treatment as usual (TAU) group, and two studies had one experimental group and a TAU control group. Treatment adherence ranged from 30% to 82.5%. Study completion rates ranged from 21.4% to 87.1%, with a mean rate of 58.3%. Two studies obtained measurements pre-post and at quarterly treatment points. One study measured participants pre-post, mid treatment and additionally at follow-up. One study obtained measurements pre-intervention and multiple follow-up points only. Three studies acquired outcome measures pre-post intervention and at one follow-up point. One study acquired measurements pre-post and multiple follow-up points. Two studies obtained measurements pre-intervention and at follow-up only, with one of these including multiple follow-up points. Across the varying measurement points, a range of psychological and physical outcomes were assessed predominantly via self-report questionnaires, with two studies opting for the inclusion of clinician administered measures. Included psychological measures were both cancer specific and generic. Generic measures included anxiety, QoL, emotional control, coping, thought suppression, negative self-thoughts related to self and the world, and feelings of hopelessness. Cancer specific psychological measures included cancer-related QoL and post-traumatic stress disorder (PTSD), adjustment to cancer and cancer-related distress. In accordance with the inclusion criteria, all studies included at least one standardised measure looking at a construct related to psychological functioning or quality of life (Table 2). Physical measures comprised of medical information such as type, course and stage of cancer, time since diagnosis, prognosis, treatment type, cancer-related pain, physical functioning/ability, and physical symptoms

## **Participant Characteristics**

The total number of participants was 1206, with sample sizes ranging from 35 -353. Participants were all at least 18 years of age, with a range of 18 – 85 years. All studies, except for one, utilised a majority female population, with an average of 76.81% across studies. All participants had received a cancer diagnosis of varying types and stages. Of the included studies, two studies had participants with only one type of cancer; one study only included breast cancer patients and one study only recruited patients with ovarian cancer. Nine studies included participants with a range of cancer diagnoses, with breast cancer being the predominant type. Other cancer types included: gynaecological, head and neck, colorectal, lung, haematological, hepato-pancreato-biliary, neurological, endometrial, uterine cancer, lymphoma, prostate, teratoma, astrocytoma, pancreatic, genitourinary and stomach.

## **Cognitive Behavioural Therapy**

Three of the included papers reported the use of interventions that were solely based on CBT and did not utilise any additional components from other therapeutical modalities. Eligibility criteria varied across studies. Sessions were delivered across the studies by a range of therapists, nurses, and masters level psychologists. The three studies reported sessional durations of between 50, 60 and 90 minutes respectively. The number of sessions offered to participants ranged from 5 weeks to 12 weeks, with a mean of eight weeks across studies. All sessions occurred in person on a weekly basis. The percentage of participants who attended all sessions ranged from 31.3% to 76% with a mean of 59.77% adhering to all sessions. Key intervention components shared across the studies included a focus on socialisation to the model, formulation and highlighting the relationship between pain, suffering and emotions. Techniques utilised to this end included cognitive restructuring, behavioural activity scheduling, relaxation strategies and attentional distraction, problem solving, positive self-statements and relapse prevention. One study additionally tailored some of the core generic components to become cancer specific. These adaptations included psychoeducation regarding cancer and imaginal and graded in vivo exposure to difficult cancer-related memories.

## **Acceptance and Commitment Therapy**

Of the included studies, three focused on the use of ACT within this population. Facilitators were clinical psychologists or doctoral level clinical psychologist trainees. Interventions ranged in the number of individual sessions from one to twelve. Sessions occurred once weekly with a range of one to twelve weeks. On average, participants attended ACT sessions for 7.3 weeks. One study comprised of a one session only intervention of 120 minutes duration. The other two interventions utilised sessional lengths of 45 minutes and 60 minutes respectively.

Study completion rates ranged from 62% to 87.1% with a mean completion rate of 71%. Sessional adherence was not reported by the authors. The shared emphasis of the interventions was on developing awareness of difficult thoughts and feelings, separating oneself from the distress and clarifying values and commitment to working towards values-directed goals. Techniques utilised to this end included mindfulness, cognitive defusion exercises, acceptance and willingness activities, value-based tasks, and goal setting. One paper did not report the details of their intervention and the author did not respond to requests for further information.

## **Supportive Approaches**

Five of the studies reported on the use of supportive therapies as a standalone intervention. The interventions were facilitated by a range of professionals including psychologists, psychiatrists, and social workers. The number of sessions offered ranged from 6 to 12 with all interventions comprising of weekly sessions. Across all supportive therapy-based interventions, participants took part for an average of 7.8 weeks. Of the studies that reported sessional length, the duration of sessions ranged from 45 minutes to 90 minutes with 60-minute sessions being recorded most frequently. Two studies reported on the percentage of participants who attended all sessions and reported rates of 76% and 82.5%. Study completion rates ranged from 54% to 82.5%, with a mean completion rate of 64.56%. Shared components across the interventions included adopting a non-directive explorative stance, providing validation and reassurance emphasising discussion and reflection on reaction rather than a skill focus. Cancer-specific

incorporations to the approach included providing information related to cancer and space to reflect upon emotional reactions to cancer. One study which incorporated an interpersonal psychotherapy element emphasised the use of psychotherapeutic techniques such as reflection, clarification and exploration and additionally promoted sources of meaning as a fundamental resource in coping with cancer.

## **Study Results**

The main characteristics of the interventions have been extracted from eligible studies and described in Table 1. Table 2 presents the main study findings with effect sizes as reported by the study author or as calculated using means, standard deviations, and sample sizes in instances where the information was not readily available. As per Cohen's classification (1998), effect sizes of 0.2 are understood to be small, 0.5 medium, and 0.8 large.

**Table 2***Study Results*

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
<b>CBT</b> Serfaty, 2019 UK	RCT	Pre intervention, at 12 and 24 weeks post.	NS group differences in BDI-II depression scores post intervention ( $p>.05$ ).
	Tx: CBT (n = 115)	Psychological: Depression (BDI-II and PHQ-9) Health status/functioning (EQ-5D-5L)	NS trend towards improvement in health functioning ( $d=.22$ ; S). and PHQ-9 depression ( $d=.71$ ; M-L) for the CBT group at 24 weeks post intervention.
	TAU (n = 115)	Pre intervention, six weeks, 9 weeks, 18 weeks, and 24 weeks.	<sup>B</sup> Significant improvement in depression (BDI-II) scores at 12 weeks for CBT participants who were married, widowed, or divorced ( $p<0.001$ ).
		Physical: Physical functional ability (ECOG-PS) Collected at baseline, 12 and 24 weeks:  Client service receipt inventory.	



First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
<b>CBT</b>	RCT:	Data were collected immediately	<sup>B</sup> Significant treatment effect on
Dalton, 2004	Tx:	pre- and post- intervention, and at	psychological quality of life at six
USA	<ul style="list-style-type: none"> <li>• CBT (n = 47)</li> <li>• Profile tailored CBT (n = 50)</li> </ul>	one-month and six-months post-intervention.	months post intervention for standard CBT ( $p < .05$ ).
	TAU (n = 34)	Psychological: <ul style="list-style-type: none"> <li>• Mood (Profile of mood states – short form)</li> <li>• Quality of life (Medical outcomes study short form health survey (SF-12).</li> </ul>	<sup>B</sup> Significant improvement in physical quality of life ( $p < .05$ ) and interference ( $p < .05$ ) for standard CBT compared to TAU immediately post intervention.
		Functional: <ul style="list-style-type: none"> <li>• Independence of living (Index of independence of ADLS scale)</li> </ul>	NS improvements in physical quality of life at six months post intervention ( $p > .05$ ).
		Physical: <ul style="list-style-type: none"> <li>• Pain (Brief pain inventory)</li> <li>• Distress related to cancer symptoms (Symptom distress scale)</li> </ul>	

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
<b>CBT and Supportive approaches</b>	RCT	Pre intervention and at 1-, 6- and 12-months post intervention.	<b>SC:</b>
Kangas, 2012	Tx:		Significant reduction in PTSD at 1 month post intervention ( $p < .05$ , $d = -.36$ , $a_g = -.35$ ;S), 6 months post intervention ( $p < .05$ , $d = .74$ , $a_g = .71$ ;M-L) and at 12 months post intervention ( $p < .05$ , $d = .15$ , $a_g = .13$ ;S).
Australia	SC (n= 14) CBT (n = 21)	Psychological: <ul style="list-style-type: none"> <li>• Cancer-related PTSD (Clinician Administered PTSD Scale as per DSM-IV criteria)</li> <li>• Anxiety, mood and substance use (SCID-DSM-IV).</li> <li>• Cancer related PTSD symptom severity (PCL-S).</li> <li>• Depression (BDI-II)</li> <li>• Anxiety (STAI)</li> <li>• Negative thoughts relating to self and the world (PTCI)</li> <li>• Quality of life (FACT-G)</li> </ul>	Significant reduction in anxiety at 1 month post intervention ( $p < .05$ , $d = .70$ , $a_g = .67$ ;M), 6 months post intervention ( $p < .05$ , $d = .144$ , $a_g = 1.34$ ;S), and 12 months post intervention ( $p < .05$ , $d = 1.06$ , $a_g = .98$ ;L).  Depression scores significantly reduced at 1 month post intervention ( $p < .05$ , $d = 0.10$ , $a_g$

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
			<p><math>=.09</math>;S), 6 months post intervention (<math>p&lt;.05</math>, <math>d=.35</math>, <math>^a g = .33</math>;S) and at 12 months post intervention (<math>p&lt;.05</math>, <math>d=.26</math>, <math>^a g = .23</math>;S).</p> <p>Significant improvements in QoL at 1 month post intervention (<math>p&lt;.05</math>, <math>d=.39</math>, <math>^a g=.38</math>;S), 6 months post intervention (<math>p&lt;.05</math>, <math>d=.70</math> <math>^a g = .69</math>;M) and 12 months post intervention (<math>p&lt;.05</math>, <math>d=0.42</math>, <math>^a g = .40</math>;S).</p> <p><b>CBT:</b></p> <p>A significant reduction in PTSD at 1 month post CBT intervention (<math>p&lt;.05</math>, <math>d=-.47</math>, <math>^a g=-.46</math>;S-M), 6 months post intervention (<math>p&lt;.05</math>, <math>d=.1.07</math>, <math>^a g =.1.03</math>;S) and 12 months</p>

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
			post intervention( $p < .05$ , $d = .63$ , $a_g = .60$ ;M).
			Significant reductions in anxiety were found at 1 month post intervention ( $p < .05$ , $d = .34$ , $a_g = .33$ ;S), 6 months post intervention ( $p < .05$ , $d = 1.25$ , $a_g = 1.21$ ;L), and 12 months post intervention ( $p < .05$ , $d = 1.15$ $a_g = 1.12$ ;L).
			Depression scores significantly reduced at 1 month post intervention ( $p < .05$ , $d = .32$ , $a_g = .31$ ;S), 6 months post intervention ( $p < .05$ , $d = .89$ , $a_g = .86$ ;L) and at 12 months post intervention ( $p < .05$ , $d = .53$ , $a_g = .50$ ;M).

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
<b>Supportive approaches</b>	RCT	Pre, quarterly (before the 4 <sup>th</sup> and 8 <sup>th</sup> session) and post-intervention.	Significant improvements in independently assessed depression at 4 weeks (HAM-D; $p<.001$ , $d=.94$ , $a_g=.94$ ;L), 8 weeks ( $p<.001$ , $d=-1.2$ , $a_g=-1.3$ ;S) and at 12 weeks post intervention ( $p<.001$ , $d = -.98$ , $a_g=-1.01$ ;L).
Blanco, 2019			
USA	Tx:	Psychological:	
	Interpersonal psychotherapy (n = 46)	Administered by independent evaluators	
	Problem solving therapy (n = 43)	<ul style="list-style-type: none"> <li>Depression (HAM-D)</li> </ul>	
	Supportive psychotherapy (n = 45)	<ul style="list-style-type: none"> <li>Clinical presentation (clinical global impression severity scale)</li> </ul>	Significant reductions in self-rated depression at 4 weeks ( $p<.001$ , $d=-.85$ , $a_g=-.84$ ; L), 8 weeks ( $p<.001$ , $d=-1.13$ , $a_g=-1.13$ ;L) and 12 weeks ( $p<.001$ , $d=-1.2$ , $a_g=-1.17$ ;L).
		Self-administered	
		<ul style="list-style-type: none"> <li>Depression (BDI-II)</li> <li>Quality of life and satisfaction (Q-LES-Q)</li> <li>Psychosocial functioning (SF-12v2)</li> <li>Client Satisfaction with intervention (CSQ-8)</li> </ul>	Significantly higher QoL scores were found at 4 weeks ( $p=.01$ , $d=.37$ , $a_g=.37$ ;S), 8 weeks ( $p=.004$ , $d=.55$ , $a_g=.55$ ;M) and 12 weeks ( $p=.044$ , $d=.36$ , $a_g=.35$ ;S).

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
		<ul style="list-style-type: none"> <li>Psychiatric comorbidity (SCID)</li> </ul> <p>Physical:</p> <ul style="list-style-type: none"> <li>Medical history and course and stage of breast cancer.</li> </ul>	NS differences were found between treatment groups on any of the outcomes. ( $p > .05$ ).
<b>Supportive approaches</b>	RCT		
Manne, 2017	Tx:	Participants completed surveys at baseline and at 3-, 6- and 9-months post baseline.	Significant improvements in depressive symptoms 6 months post intervention ( $p < .05$ ) ( $d = -.60$ , $^a g = -.58; M$ ) and at the 9-month follow-up time point ( $p < .05$ ) ( $d = -.68$ , $^a g = -.65; M$ ).
USA	<ul style="list-style-type: none"> <li>Coping and communication (n = 122)</li> <li>Supportive counselling (n = 120)</li> <li>UC (n = 111)</li> </ul>	<p>Psychological:</p> <ul style="list-style-type: none"> <li>Depression (BDI-II)</li> <li>Emotional expression (EEQ)</li> <li>Cancer related distress (IES)</li> </ul> <p>Physical:</p> <ul style="list-style-type: none"> <li>Physical symptoms (Cancer rehabilitation Evaluation System)</li> </ul>	<p>Greatest reduction in depressive symptoms found 6.4 months after baseline assessment.</p> <p>NS differences between groups at 3-month follow-up (<math>p &gt; .05</math>).</p>

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
			Difference was found between UC and SC at 6 months that approached significance ( $p=.093$ ), with SC demonstrating lower depression scores.
			Significant difference in depression scores at 9 months post baseline between SC and UC in favour of SC ( $P=.04$ , $d=-.15$ , $^a g=-.15$ ;S).
			Cancer related distress scores were shown to significantly decrease post SC intervention ( $p<.01$ , $d=-.48$ , $^a g=-.47$ ;S-M).
<b>Supportive approaches</b>	RCT	The following self-rating scales were	At 8 weeks APT produced
Moorey, 1998	Tx:	administered within the clinic at	significantly greater change than
UK	<ul style="list-style-type: none"> <li>Supportive counselling (n = 22)</li> <li>Adjuvant psychological therapy (n = 25)</li> </ul>	baseline assessment and then at 8 weeks, 4 months and 1 year follow-up.	the SC intervention on coping with cancer ( $p=.001$ ) and anxiety ( $p=.002$ ).
		Psychological:	

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
		<ul style="list-style-type: none"> <li>Anxiety and depression (HADS)</li> <li>Anxiety (STAI)</li> <li>Depression (BDI)</li> <li>Adjustment to cancer (The Cancer Coping Questionnaire)</li> </ul>	<p>4 months from baseline, APT produced significantly greater change on measures of coping with cancer (<math>p=.01</math>) and anxiety (<math>p=.006</math>).</p> <p>SC demonstrated a significant reduction on HADS depression scores (<math>p &lt; .05</math>) on BDI scores (<math>p &lt; .05</math>) and on STAI scores (<math>p &lt; .05</math>) at 8 weeks. Significant reductions in anxiety, depression and STAI anxiety were additionally found at six months (<math>p &lt; .05</math>).</p> <p>One year post SC intervention, a significant decrease in depression was found (<math>p &lt; .05</math>).</p> <p>APT demonstrated significantly better reductions in HADs anxiety (<math>p</math></p>



First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
			= .002) and coping with cancer ( $p$ = .001) at eight weeks.
<b>Supportive approaches</b>	RCT	Pre-treatment, post treatment and follow-up.	At one year NS differences between groups found.
Breitbart, 2012.	Tx:		Significant improvements in QoL for IMCP participants compared with TM participants ( $p$ =.013, $d$ = 0.56, $a_g$ = 0.55;M).
USA	<ul style="list-style-type: none"> <li>• IMCP (n = 64)</li> <li>• Therapeutic massage (n = 56)</li> </ul>	Psychological: <ul style="list-style-type: none"> <li>• Quality of life (MQOL).</li> <li>• Depression (HADS-D),</li> <li>• Anxiety (HADS-A),</li> <li>• Hopelessness (BHS),</li> <li>• Symptom distress (MSAS-Di).</li> </ul> Physical: <ul style="list-style-type: none"> <li>• Symptom burden (MSAS-Sx)</li> </ul>	Significant improvements also found in the number of physical symptoms endorsed ( $p$ <.001, $d$ =-.36, $a_g$ =-.35;S), and in physical symptom distress( $P$ <.001, $d$ =.06, $a_g$ =-.59;M).  NS differences between groups in reducing anxiety, depression, or hopelessness.

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
			NS differences found for any of the outcome variables at 2-month follow-up.
<b>ACT</b>	RCT:	Pre, quarterly (after the 4 <sup>th</sup> and 8 <sup>th</sup> session) and post-intervention.	Significant reduction in distress scores post intervention ( $p < .05$ , $d = .91$ , $^a g = .90$ ;L) and compared to
Rost, 2012	Tx:		TAU ( $p = < .05$ , $d = 1.05$ , $^a g = 1.03$ ;L).
USA	ACT (n = 25)	Psychological:	
	TAU (n = 22)	<ul style="list-style-type: none"> <li>• Depression (BDI-II)</li> <li>• Anxiety (BAI)</li> <li>• Mood (POMS)</li> <li>• Emotional control (CECS)</li> <li>• Thought suppression (WBSI)</li> <li>• Coping (COPE)</li> <li>• Quality of life (FACT-G)</li> </ul>	<p>Significantly higher QoL scores were found post intervention (<math>p &lt; .05</math>, <math>d = .71</math>, <math>g = .70</math>;M-L) and when compared to TAU (<math>p &lt; .05</math>, <math>d = .80</math>, <math>^a g = .79</math>;M-L)</p> <p>Significant improvements in depression post intervention (<math>p &lt; .05</math>, <math>d = 1.04</math>, <math>^a g = 1.03</math>;L) and compared to TAU (<math>p &lt; .05</math>, <math>d = .67</math>, <math>^a g = .65</math>;M)</p> <p>Significant improvements in anxiety (<math>p &lt; .05</math>, <math>d = 1.2</math>, <math>^a g = 1.2</math>;L) post ACT</p>

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
<b>ACT</b> Feros, 2013	Pre-post TX: <ul style="list-style-type: none"> <li>ACT (n = 45)</li> </ul>	Pre, mid, and post-intervention and at 3-month follow-up.  Psychological: <ul style="list-style-type: none"> <li>The Distress Thermometer [DT]</li> <li>The Depression, Anxiety, and Stress Scale [DASS; 29]</li> <li>The Acceptance and Action Questionnaire II is a 10-item instrument measuring psychological flexibility.</li> <li>Functional Assessment of Cancer Therapy [FACT; 30]</li> </ul>	<p>intervention were found, this improvement was significantly greater than TAU (<math>p &lt; .05</math>, <math>d = .96</math>, <math>a_g = .94</math>; L).</p> <p>Significant improvements in psychological distress post intervention (<math>p &lt; .05</math>, <math>d = 1.11</math>, <math>a_g = 1.10</math>; L) and at 3 months follow-up (<math>p &lt; .05</math>, <math>d = .87</math>, <math>a_g = .87</math>; L) compared to baseline.</p> <p>Significant improvements in mood post intervention (<math>p &lt; .05</math>, <math>d = .99</math>, <math>a_g = .98</math>; L) and at 3 month follow-up (<math>p &lt; .05</math>, <math>d = 1.12</math>, <math>a_g = 1.11</math>; L) compared to baseline.</p> <p>Significant improvements in QoL scores were found post intervention (<math>p &lt; .05</math>, <math>d = .56</math>, <math>a_g = .56</math>; M) and at 3</p>

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported <i>p</i> and ES ( <i>d</i> ), calculated <i>g</i> )
			months follow-up ( $p < .05$ , $d = .47$ , $a_g = .47$ ; S-M) compared to baseline.
			Psychological flexibility was found to increase mid intervention ( $p < .05$ , $a_g = .38$ $d = .38$ ; S) post intervention ( $p < .05$ , $d = .64$ , $a_g = .64$ ; M) and at follow-up ( $p < .05$ , $d = 1.37$ , $a_g = 1.37$ ; L) compared to baseline. Flexibility scores also significantly increased at follow-up compared to post intervention scores ( $p < .05$ , $d = .63$ , $a_g = .62$ ; M)
			No SD were found post-intervention to 3-month follow-up for distress, mood disturbance or quality of life ( $p > .05$ )
<b>ACT</b>	RCT	Pre, and post intervention at 3 months post-surgery.	NS differences in post-operative pain nor breast pain at 1 week ( $p > .05$ )
Hadlandsmyth,	Tx: <ul style="list-style-type: none"> <li>• ACT (<math>n = 31</math>)</li> </ul>		

First author, Year, Country	Design	Outcome measures and timing of assessments	Main findings (reported $p$ and ES ( $d$ ), calculated $g$ )
2019 USA	<ul style="list-style-type: none"> <li>TAU (n = 31)</li> </ul>	Psychological: <ul style="list-style-type: none"> <li>Depression (PHQ-8)</li> <li>Anxiety (GAD-7)</li> </ul> Pain specific measures: <ul style="list-style-type: none"> <li>Pain catastrophising (PCS)</li> <li>Pain acceptance (CPAQ-20)</li> <li>Pain intensity (numeric rating scale and brief pain intensity BPI)</li> </ul>	Improvements in anxiety scores at 3 months post operatively ( $C_d = -.58$ , $a_g = -.57$ ; M) and depression ( $C_d = -.07$ , $a_g = 0.07$ ; S).  The between group effect size for anxiety at 3-month post-surgery ( $C_d = .42$ , $a_g = .41$ ; S-M).

*Note.* <sup>a</sup>Calculated effect size with correction for small sample bias; <sup>b</sup> $g$  not calculated as information not available in full-text paper and no response from authors upon request of supplementary information. <sup>c</sup>Significance testing not undertaken due to study being feasibility pilot. S, M, L indicate respectively small, medium, and large effect sizes.

Key. ACT = Acceptance and Commitment Therapy; ADLS = Activities of Daily Living Scale; BDI-II = Beck's depression inventory-II; BHS = Beck Hopelessness Scale; CECS = Courtauld Emotional Control Scale; CBT = Cognitive Behavioural Therapy; CPAQ-20 = Chronic Pain Acceptance Questionnaire; CSQ-8 = coping Strategies Questionnaire; DASS = Depression Anxiety Stress Scales; DT = Distress Thermometer; EQ-5D-5L = EuroQol ; EEQ = Emotional Expression Questionnaire; GAD7 = Generalised Anxiety Disorder Screener; FACT-G = Functional Assessment of Cancer Therapy;; HADS=Hospital Anxiety and Depression Scale; HAMD = Hamilton Depression Rating Scale IES = Impact of Even Scale; MQOL =McGill Quality of Life Questionnaire; NS = non-significant; PCS = Pain Catastrophising Scale; PHQ-9=Patient Health Questionnaire; PCL-S = Post Traumatic Stress Disorder Checklist; PMS=Profile of Mood States; Q-LES-Q = The Quality of Life, Enjoyment, and Satisfaction Questionnaire-Short Form; QOL=Quality of Life; STAI = State Trait Anxiety Inventory; SCID = The Structured Clinical Interview for DSM Disorders; WBSI = White Bear Suppression Inventory; POMS = Profile of Mood States; PTCI = Post Traumatic Cognitions Inventory ; PTSD = Post Traumatic Stress Disorder; SCID-DSM-IV = Structured Clinical Interview –American Psychiatric Association's Diagnostic and Statistical Manual for Mental Disorders; SF-12v2 = Short Form Health Survey; TAU = Treatment as usual; UC = Usual

## **Cognitive Behavioural Therapy**

Of the three studies which utilised CBT as a primary intervention, a mixture of generic psychological outcomes and cancer specific measures were assessed. All eligible CBT-based studies utilised an RCT design and obtained measures pre, post and at least once at follow-up. Significant improvements were found by Kangas et al. (2012) in cancer related PTSD one month post-intervention with a large effect size. Follow-up data indicated that this reduction remained significant at 12 months with a medium effect size. Kangas et al. (2012) additionally found significant reductions in participant anxiety at one, six- and 12-months post intervention with large effect sizes found at the six- and 12-month assessment point. Similar significant reductions were found for depression with small effect sizes noted. Two studies found CBT to be of limited benefit in terms of mood-based outcomes. Dalton (2004) did not find any significant differences in self-reported mood post intervention compared to TAU, Serfaty et al. (2019) similarly observed non-significant improvements in low mood and depression post intervention. However, when Serfaty et al. (2019) analysed the data for a subgroup of married, divorced, or widowed participants, a significant reduction in depression scores was observed post intervention. All three CBT studies looked at the effect of CBT on QoL with two of the studies finding no significant improvements (Kangas et al., 2012; Serfaty et al., 2019). One study found significant improvements in the psychological functioning component of QoL at six months post intervention (Dalton 2004) after noting no significant improvements in psychological functioning component of QoL for CBT patients immediately post intervention. Significant improvement in the physical functioning component of QoL was also observed by Dalton (2004) for both standard CBT and profile tailored CBT participants compared to TAU immediately post intervention. These improvements in the physical functioning component of QoL did not remain significant at six months post intervention.

## **Acceptance and Commitment Therapy**

Two of the ACT-based studies utilised an RCT design, with one study opting for a pre-post intervention design. A range of generic and cancer-specific psychological measures were used across the ACT studies. One study found a significant reduction in psychological distress post intervention compared to baseline and in comparison to TAU with a large effect size (Rost, 2012). Similarly, Feros (2013) found a

significant reduction in psychological distress post intervention and at three months follow-up with a large effect size when compared to baseline. Two studies found significantly higher QoL scores post-intervention. Rost (2012) found an increase in QoL compared to TAU with a large effect size (Rost, 2012) whilst Feros (2013) similarly found significant improvements at the three months post intervention measurement compared to TAU with a medium effect size. Two studies reported a reduction in mood disturbance with Rost (2012) reporting a significant reduction in depression scores post intervention compared to TAU, with a medium to large effect size. Similarly, Feros (2013) found a significant reduction in mood disturbance post intervention and at three-month follow-up with large effect sizes. One study reported a significant reduction in anxiety at one month and six months post intervention compared to TAU with a large effect size (Rost, 2012). Hadlandsmyth (2019) did not carry out significance testing due to being a feasibility study. The impact of the ACT intervention on anxiety and depression was instead only explored in terms of effect size, with a medium effect size found in terms of anxiety at three months post intervention. No effect was found for depression scores post intervention (Hadlandsymth, 2019).

### **Supportive Counselling**

Five studies utilised a supportive therapeutic approach as a primary intervention. Across the studies, a mixture of generic psychological outcomes and cancer-specific measures were used, which were either self-administered or clinician directed. Four studies found depression scores to reduce post SC intervention (Blanco, 2019; Kangas et al., 2012; Manne, 2017; Moorey, 1998). Kangas et al. (2012) found a significant reduction in depression scores at one month, six and twelve months with small effect sizes. Manne (2017) reported a significant reduction in depressive scores at nine months follow-up compared to usual care with a medium effect size and found depressive symptoms to be at their lowest four months post intervention. Moorey (1998) found a significant reduction in depression and likewise, Blanco (2019) found significant improvements in both clinician assessed and self-assessed depression at the four- and eight-week midpoints and post intervention with large effect sizes. One study found no significant differences in low mood between supportive counselling and usual care and coping and communication at three or six months (Manne, 2017). Similarly, Breitbart (2012) found no significant differences in

depression scores post intervention when compared to therapeutic massage. One study found a significant reduction in PTSD symptoms at one month post intervention with a small effect size (Kangas, 2012). This reduction continued to be significant compared to baseline at six months and 12 months with medium and large effect sizes respectively. Two studies found significant reductions in participant anxiety scores. Moorey (1998) found this to be the case at eight weeks, four months and one year post intervention (Moorey, 1998). However, when this reduction in anxiety at eight weeks was compared to adjuvant psychological therapy (APT), APT was found to result in significantly greater reductions. Additionally, at one year, there were no significant differences between SC and APT. Kangas et al. (2012) found a significant reduction in anxiety scores at one month, six months and twelve months post intervention with large effect sizes (Kangas et al., 2012). Three studies found significant improvements in QoL post SC intervention (Breitbart, 2012; Blanco, 2019; Kangas et al., 2012). Blanco, 2019 reported significantly higher QoL scores at two mid points during treatment and post intervention with a small effect size. When compared to interpersonal psychotherapy or problem-solving therapy, Blanco (2019) did not find supportive psychotherapy to have any significant benefits. Significant improvements in QoL at one month (small effect size), six months (medium effect sizes) and 12 months (small effect size) post intervention were found by Kangas et al, 2012. Breitbart (2012) compared QoL outcomes for SC with therapeutic massage and found SC to result in greater improvement with a medium effect size. Additionally, Breitbart (2012) found significant reductions in physical symptom distress when compared to therapeutic massage™. Further to core supportive counselling components, Breitbart (2012) incorporated spiritual components to the intervention and found significant improvements in spiritual wellbeing when compared to TM with a small effect size. At the two-month follow-up point, no significant differences were found between SC and TM (Breitbart, 2012).



**Table 3***Quality Assessment*

First author, year	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Overall Quality Rating	Overall Quality rating excluding blinding
<b>CBT</b>								
Serfaty, 2019	moderate	strong	strong	moderate	strong	weak	moderate	moderate
Dalton, 2004	strong	strong	strong	weak	strong	weak	weak	moderate
<b>CBT and SC</b>								
Kangas, 2012	weak	strong	strong	moderate	strong	weak	weak	moderate
<b>Supportive approaches</b>								
Blanco, 2019	moderate	strong	strong	moderate	strong	weak	moderate	moderate
Manne, 2017	weak	strong	strong	weak	strong	moderate	weak	moderate
Moorey, 1998	weak	strong	weak	weak	strong	strong	Weak	weak
Breitbart, 2012	moderate	strong	strong	weak	strong	weak	weak	moderate
<b>ACT</b>								
Rost, 2012	moderate	strong	strong	weak	strong	strong	moderate	strong
Feros, 2013	weak	moderate	strong	weak	strong	moderate	weak	moderate
Hadlandsmyth, 2019	moderate	strong	strong	weak	strong	moderate	moderate	strong

*Note.* Overall quality rating: ‘Strong’ = 0 weak ratings, ‘moderate’ = 1 weak rating, ‘weak’ = ≥2 weak ratings’

## Quality Assessment

Table 3 presents the quality assessment rating of each study. With the exclusion of blinding, most of the studies acquired a moderate quality rating, with one study obtaining a weak rating and two obtaining a strong rating. Frequently noted areas of weakness across the studies related to selection bias, with participants typically self-referring to participate and with studies not reporting in relation to participant blinding. The design and purpose of included studies are such that blinding participants is not typically feasible or appropriate. To account for the skewness that would have arisen if blinding were to be taken into consideration, an extra column was added to the table to allow to exclusion of the blinding criteria. With this allowance, five of the studies with initial 'weak' ratings subsequently obtained 'moderate' ratings.

## Discussion

Given the recognised impact of living with cancer on mental health and other patient-reported outcomes, and the number for whom these psychological needs go unmet (MacMillan, 2015), this review sought to systematically explore the literature to examine the effectiveness of different psychological interventions for people living with cancer.

### Comparable effectiveness across interventions

All included studies utilised at least one measure of self-reported psychological outcome, which was taken pre and post intervention as a minimum. Except for one CBT-based intervention (Dalton et al., 2004), all studies reported significant improvements on at least one patient-reported psychological outcome measure from baseline to post intervention. These improvements were seen in measures of depression, anxiety, or psychological distress. Substantial variation was found in terms of effect sizes across the interventions, ranging from small to large. Of the studies which included follow-up measurements, these changes in psychological outcome were generally shown to remain over time.

All CBT-based studies encompassed measures of anxiety and/or depression. One of these interventions (Kangas et al., 2012), which looked at patients with head and neck cancer, reported improvements in self-rated levels of depression with small effect sizes post intervention. This improvement was found to remain at two subsequent follow-up points. The other two CBT-based studies looked at low

mood among participants with a range of diagnoses and found no significant improvement in self-reported mood compared to TAU (Dalton et al., 2004), or in self-reported depression compared to baseline (Serfaty et al., 2019). Serfaty et al. (2019) did find however, that for a subgroup of married, divorced, or widowed participants, a significant reduction in depression scores occurred post intervention. Only one CBT-based study included a specific measure of anxiety (Kangas et al., 2012), with large effect sizes found at one month, six months and twelve months post intervention.

All the ACT-based studies found beneficial gains on either a measure of depression or anxiety, with medium to large effect sizes (Feros, 2013; Hadlandysmyth, 2019; Rost, 2021). One of these studies (Rost, 2012) recruited participants with stage IV ovarian cancer and found a significant reduction in depression post intervention with a medium to large effect size. Feros et al. (2013) additionally found encouraging results whilst looking across different diagnoses and stages of cancer. A composite measure which looked at depression, anxiety, and stress together was used and a significant post intervention improvement in depression with a large effect size was found; this remained to be the case at three month follow-up. One ACT-based study which involved participants attending a one-off session did not find evidence that participants self-rated depression scores improved post intervention (Hadlandsymth, 2019). All ACT studies were shown to be of benefit in terms of anxiety levels, with large effect sizes found by Rost (2012) post intervention. However, there was no follow-up period to determine if this reduction in anxiety levels was maintained over time. Additionally, Hadlyndsymth (2019) reported a reduction in anxiety levels post intervention with a medium effect size.

Psychological outcome changes within the supportive counselling studies were varied. Significant reductions in low mood post intervention were demonstrated by four studies (Blanco, 2019; Kangas et al., 2012; Manne, 2017; Moorey, 1998). Effect sizes ranged from small to large and were maintained at various follow-up time points. The largest effect size was found by Moorey (1998) whilst looking at changes in depression among participants with a range of cancer types at varying stages. Kangas et al. (2012) found a small effect size post intervention whilst looking at depression among patients with first onset head and neck cancer. Two studies did not find significant benefits to supportive counselling in terms of depression

when compared to comparator conditions. One of these studies was looking at individuals receiving active treatment for gynaecological cancers (Manne, 2017), whilst the other was focusing on participants with a range of stage III and IV cancer diagnoses (Breitbart, 2012). Three of the SC interventions included a measure of anxiety (Breitbart, 2012; Kangas et al., 2012; Moorey, 1998). Two of these studies found significant improvements in anxiety (Kangas et al., 2012; Moorey, 1998) with Kangas et al. (2012) finding a medium effect size one month post intervention and a large effect size at six and twelvemonths follow-up. Moorey (1998) found a reduction in anxiety scores to be maintained over time, however when this reduction was compared to adjuvant psychological therapy, SC was found to be inferior. Breitbart (2012) recruited across a range of diagnoses and stages and found no significant differences in anxiety between a supportive interpersonal-based intervention and therapeutic massage.

Most included studies employed a measure through which they sought to assess participant QoL. To this end, a range of measures were used across studies. All three CBT-based studies included measures which claimed to assess QoL with mixed findings. One study found the psychological functioning component of QoL showed no improvement immediately post intervention, however psychological functioning increased at the six months post intervention (Dalton, 2004). The same study found the physical functioning component of QoL improved significantly post intervention, but this was no longer the case six months later. The other two CBT-based studies (Kangas et al., 2012; Serfaty et al., 2019) did not find any significant QoL changes at post-intervention or follow-up. Two of the ACT studies found significant post intervention improvements in QoL, measured using the FACT-G (Feros 2013; Rost 2012) with medium and large effect sizes. Additionally, Feros (2013) found this improvement in QoL was maintained at three-month follow-up. Measures of QoL of life were included in all SC interventions, with three studies finding significant improvements (Blanco, 2019; Breitbart, 2012; Kangas et al., 2012) and variable effect sizes from small to medium. One study suggested that the effect of SC on QoL diminishes over time with the effect size found to fall from medium to small at the 12-month follow-up point (Kangas et al., 2012). Two of the studies (Manne 2017; Moorey 1998) did not include a measure of QoL.

## **Efficacy across cancer types**

Given the substantial range of cancer types and treatments (Cooper, 2000), variation in both the type of mental health difficulties someone may experience and the psychological treatment they are likely to benefit from is to be expected. Acquiring an understanding as to what psychological treatments are accessible, effective, and acceptable and for which groups within the cancer population is important. Relatedly, the importance of considering subgroups and individual factors within the analysis, was highlighted within the literature review by Serfaty et al. (2019) who found significant differences in depression scores after controlling for relationship status. This finding is in accordance with previous literature (Button et al., 2012) which found relationships with others to be predictive of better CBT outcomes. Additionally, this highlights the need for further research exploring the situational and individual factors that may be influencing the effectiveness of psychological interventions.

When considering the findings of this review in relation to cancer type, the results for certain subgroups were promising. For example, participants with a range of diagnoses were shown to benefit from ACT-based interventions, whilst head and neck cancer patients were shown to particularly benefit from CBT, and less so from SC therapies. ACT being shown as a modality with applicability across cancer type and stage is in accordance with the literature (Mathew et al., 2021). Conversely, the CBT studies which looked at a range of diagnoses and stages, including not amenable to cure, did not find significant benefits. Consistent with this, Greer et al. (2010) found CBT did not sufficiently address the cognitive components of anxiety, particularly intrusive thoughts around death and disability. Relatedly, it has been argued that CBT may be less effective generally in addressing realistic thoughts about disability, cancer reoccurrence and potential morality when compared with ACT which adopts a greater acceptance-based approach whilst recognising the multifactorial nature of the distress (Hulbert-Williams, Storey & Wilson, 2015). However, there is evidence to support the utilisation of CBT for cancer patients with terminal diagnoses with Greer et al. (2012) having shown the approach to significantly reduce self-reported participant anxiety. In sum, caution must be exercised when reflecting upon the findings of this review in relation to diagnoses, as the limited number of studies means that there is insufficient research to draw substantive conclusions

regarding benefits for specific subtypes. Further, whilst ACT-based studies were shown to offer benefits across cancer types, with medium to large effect sizes, participants recruited to the studies were predominantly diagnosed with ovarian and breast cancer. Therefore, whilst one could potentially argue for the merit of the approach within breast and ovarian cancer populations, this would need to be tentative and conclusions regarding other types of specific cancer are unclear. To ensure patients are being offered the most effective treatment, future studies looking at the effectiveness of psychological interventions are likely to benefit from subgroup analysis which would be enabled in part through the recruitment of larger samples.

Overall, QoL findings for CBT-based studies were disappointing due to non-significant findings across studies, with ACT and SC-based interventions demonstrating greater improvements in effect size. To some extent, this finding echoes the CBT-based literature, where there have been mixed findings. Whilst some studies clearly demonstrate the benefits of CBT interventions in relation to QoL (Guarino et al., 2020; Ye et al., 2018), other reviews have found inconclusive results (Sun et al., 2019). Additionally, many of the studies which demonstrated significant QoL changes following psychological interventions have done so with breast cancer patients within group-based settings (Guarino et al., 2020; Ye et al., 2018) and patients in the earlier stages of disease (Greer et al., 2010). The CBT studies which were eligible for inclusion within this review did not focus on breast cancer and included patients at various stages of illness. ACT being shown as a treatment modality with applicability across cancer type and stage is in accordance with the literature (Fashler et al., 2018), ACT was shown in this review to result in medium to large effect size changes in QoL across different cancer diagnoses, further, this improvement was shown to be maintained overtime. It is noteworthy however that only one ACT-based study included a follow-up period, therefore any conclusions regarding the longevity of increases in QoL should be tentative. Further, the two ACT-based studies which looked at QoL did so via the FACT-G which has been proposed to conflate domains of QoL with health status. Further, heterogeneity across QoL measures and the recognised challenges that arise when trying to successfully assess the individualised nature of QoL cloud such findings (Bradley et al., 2001). Greater consensus is needed within the literature on the most appropriate measures to be using

and the increased utilisation of measures which focus on aspects of life which are relevant and important to cancer patients is warranted.

### **Evaluation of the current review**

There were several strengths to this review. The search strategy was constructed to be broad and open. The search terms sought to ensure a comprehensive review of the literature and reflected the extensive range of psychological outcomes that different studies choose to focus on. Mental health support within oncology is a rapidly expanding research area and as such, grey literature was searched, seeking to minimise the risk of publication bias and heighten the reviews reach. An independent reviewer was employed to review study selection and quality assessment, thus reducing the risk of methodological error and researcher bias. To enable fairer comparison across treatment effects, a sample bias-correction was carried out to account for smaller sample sizes.

There were also several confines to this review. Firstly, there was a particularly high degree of heterogeneity within intervention types, particularly within non-directive supportive approaches. For example, one study incorporated a spiritual focus into the intervention (Brietbart, 2012). While such variation is very likely to be reflective of everyday clinical practice, this makes it difficult to ascertain the contribution of non-directive approaches without the additional components. Whilst all interventions were delivered face to face and in person, there was also substantial variation in the duration of interventions both within and between the approaches, making it difficult to compare and draw conclusions. This heterogeneity extended to outcome measures; an assortment of self-reported assessment tools was used. This was particularly noticeable when looking at the QoL measures, where five different measures were used across seven studies. Furthermore, these QoL measures typically conflate health status with quality of life and fail to recognise the individualised nature of QoL (Bradley, 2001). This conflation has been recognised and addressed through the design of the cancer dependent quality of life (CanderDQoL) measure (Garden et al., 2022). Additionally, there was distinct omission of behavioural and cancer specific measures across the studies, with outcomes being primarily generic in nature and focused on psychosocial

and physical functioning. This oversight and need for greater use of behavioural and cancer specific measures is recognised within the literature generally (Grimmett et al., 2019; Versteegh et al., 2012).

It is also important to consider the types of study design being compared. For example, whilst all the CBT-based studies were predominantly RCTS, only two of the ACT studies were classified as such. ACT studies are often criticised within the literature for the variation in the quality of studies (Linardon et al., 2018). The ACT-based studies were additionally represented by the smallest number of papers within this review. There are likely multiple reasons for this. This perhaps predominantly reflects the lack of studies looking into the effectiveness of this approach on an individual basis within this population. It additionally reflects methodological limitations, with several studies not being eligible for inclusion due to the use of unvalidated outcome measures. Subsequent conclusions from comparisons between approaches may therefore benefit from being held lightly.

The quality of included studies was generally mixed with most papers acquiring a weak rating unless blinding was accounted for. Whilst this primarily suggest higher quality studies are needed, it should be noted that once blinding was accounted for, most studies were of moderate quality. Given that all the studies utilised self-reported outcome measures, the impact of non-blinding practice is likely to be reduced. Two studies did not report effect sizes (Moorey, 1998; Serfaty et al., 2019), nor did they provide the data for Hedges  $g$  to be calculated and one study was not able to carry out significance testing due to a small number of participants (Hadlandsymth et al., 2019). Relatedly, the generalisability of the findings from this review may also be limited to some extent due to the sample being 82% female, despite rates of cancer being substantially higher in males (Cook et al., 2009).

## **Conclusions**

There was substantial heterogeneity across included studies in terms of design, measures, and methodological quality which made meaningful comparisons between interventions difficult. In accordance with previous studies, this review found all three intervention types to be able to offer some beneficial gains in relation to psychological measures or QoL. The largest effect sizes in this regard were seen for the ACT-based interventions, with one study demonstrating beneficial gains across different types of cancer.



Whilst this arguably provides support for the notion of ACT being conceptually well suited to meet the needs of people living with cancer (Hulbert-Williams et al., 2014), caution is needed. There was a discrepancy in the number and designs of the ACT-based studies, with only one study being an RCT and having a follow-up period. Therefore, future methodologically robust studies looking at the use of ACT and psychological interventions generally within this population, are likely to be of benefit moving forwards. When considering QoL specifically, CBT was shown to be of limited benefit. This finding may be reflective of the challenges that arise when trying to conceptualise and measure QoL versus health status (Bradley, 2001; Lin et al., 2013). ACT and SC were both shown to demonstrate improvements on measures of QoL, with ACT revealing the greatest effect size which remained stable three months post intervention.

All three intervention types were found to be vulnerable to augmentation in everyday practice, with some variation to be expected. Supportive nondirective therapy was shown to demonstrate a great deal of variation across studies, reflected perhaps most obviously through the different names given to the approach by studies. Further, a lot of the core techniques and strategies that are utilised by this approach can be seen to be incorporated into CBT and ACT-based approaches. Arguably this is something to be mindful of when comparing across the different approaches and an area which may benefit from audit and evaluation to ensure augmentation occurs in line with the evidence base.

### **III. Web-based Acceptance and Commitment Therapy for People Living with Cancer. A Pilot Study Using Single Case Experimental Design.**

## Abstract

Individuals seeking psychological support following a cancer diagnosis can often face long wait times and may have to overcome various challenges to physically attend in person sessions. Web-based psychological support therefore holds great promise for people living with cancer. People are living longer with cancer and an increasing amount of evidence supports the use of ACT for people living with long term conditions. The use of ACT within oncology, however, remains within its relative infancy. This study sought to develop a web-based ACT intervention for people living with cancer and examine its feasibility and acceptability in addition to preliminary effectiveness on psychological, quality of life and process outcomes. A randomised multiple-baseline SCED was utilised to assess for treatment effects within and across participants (n=6) via visual and Tau-U analysis of data acquired from visual analogue scales (VAS). Participants were recruited through Maggie's at The Royal Marsden and through social media and were randomly assigned to a baseline length of 1-3 weeks prior to accessing the six-week online ACT intervention. Post-intervention, participants entered a four-week follow-up period. VAS measures were completed throughout the study which looked at low mood, anxiety, mindfulness, and how bothered participants were by pain and fatigue. Pre, post-intervention and at follow-up, participants completed standardised measures looking at anxiety and depression symptoms, cancer-specific QoL and ACT processes. Standardised data were analysed using reliable and clinically significant change. The intervention was found to be acceptable for people living with cancer. Evidence of improvement in low mood and anxiety was found for most participants, with these improvements largely remaining at follow-up. Additionally, most participants reported significant improvements in how bothered they were by fatigue post-intervention and at follow-up. Half of the sample reported improvements in how bothered they were by pain post-intervention. Improvements in mindfulness post intervention and at follow-up were reported by most participants. QoL improvements were found for two participants post intervention and three at follow-up, whilst psychological flexibility improvements were found for most participants post-intervention but only two at follow-up. Findings support the acceptability of online ACT-based interventions for people living with cancer and its preliminary effectiveness on self-reported psychological

outcomes and psychological flexibility. Methodological shortcomings and recommendations for future studies are discussed.

## **Introduction**

### **Cancer and psychological support**

Cancer screening advancements and the increasing accessibility of effective treatment regimens has resulted in people living longer with cancer (Siegel et al., 2022). The number of people alive 5 years post cancer diagnosis in 2018 was estimated to be 43.8 million across 36 cancer types and 185 countries (Ferlay et al., 2018). With current rates of survivorship predicted to rise exponentially over the next eighteen years (Shapiro, 2018), there is both greater opportunity and necessity to assess and follow-up on the psychological welfare and quality of life (QoL) of people living with cancer (Wenzel et al., 2005). Whilst research has found QoL to increase over time (Bloom et al., 2012), Ganz et al. (2002) found such improvements did not occur until many years post treatment. As such, ensuring effective support and improving QoL for this population has been reflected as a central ambition of the government's 10-year cancer plan for England (Department of health; DOH, 2022).

Emotional distress is often reported by people going through cancer treatment (Strong et al., 2007), however the provision of adequate mental health support continues to present a global challenge (Niedzwiedz et al., 2019). People living with cancer often report experiencing significant levels of worry and stress whilst trying to navigate the physical effects of cancer and its treatment. Whilst often life sustaining, treatments typically come with a range of unpleasant side effects including but not limited to pain, fatigue, and disability (Magasi et al., 2022). Furthermore, treatments such as immunotherapy and chemotherapy can potentially induce psychological difficulties, such as depression, through reducing dopaminergic transmission (Smith, 2015). Social consequences such as the inability to work and financial difficulties can further compound the distress caused by physical health limitations (Hanratty et al., 2007).

The risk of developing a common mental health problem such as anxiety and depression is heightened in the context of previous mental health difficulties with such patients also recognised to face

higher mortality rates (Klaassen et al., 2019). It is important to note however, that for many people living with cancer, self-reported levels of psychological distress are below clinical thresholds with some studies finding mental health difficulties within the cancer population to be equivalent to that found in the general population (Adler & Page, 2008). However, even for patients below clinical threshold levels, worries, fears, and other psychological stressors can equate to significant levels of distress (Charmaz, 2000). Feelings of guilt, anger, low mood, fear, and a sense of having lost control are frequently cited by individuals with cancer (Hamilton et al., 2009; Stanton et al., 2001). Whilst these patients may not go on to develop clinical levels of psychological distress, diagnosis can impact on a person's mental health irrespective of psychiatric history (Pitman et al., 2018). The effective identification and management of psychological difficulties during the cancer trajectory continue to pose a challenge, with patients reporting unfulfilled needs and a wish for psychological support (Harrison et al., 2009; Merckaert et al., 2010). Given the associated risk of mental health difficulties and the potential impact on treatment, immune response and survivorship, effective psychological support for people living with cancer is paramount. A review of the literature found psychological therapies can be effective in improving emotional adjustment, QoL, and may facilitate the development of coping skills and functional adjustment (Newell et al., 2002).

One psychological treatment modality that has acquired the greatest empirical support within oncology, in part due to having attracted the most research interest (Hulbert-Williams et al., 2018), is group-based Cognitive Behavioural Therapy (CBT). CBT has been shown in several studies to be beneficial for cancer patients, leading to improvements in stress (Brothers et al., 2011), fatigue, QoL (Lee et al., 2011), anxiety (Greer et al., 2008), distress and pain management (Tatrow & Montgomery, 2006). However, there is debate within the literature about how effective CBT is in terms of treating the anxiety and depression that frequently accompany a cancer diagnosis. For example, a review which looked at the use of CBT within breast cancer highlighted the need for any conclusions regarding the effectiveness to be held tentatively due to a lack of documentation and poor understanding regarding key issues in rehabilitation (Fors et al., 2011). Additionally, Serfaty et al. (2020) found CBT to be ineffective for people living with advanced cancer. An alternative approach which has been proposed to be comparable to CBT (Feros et al., 2013) and

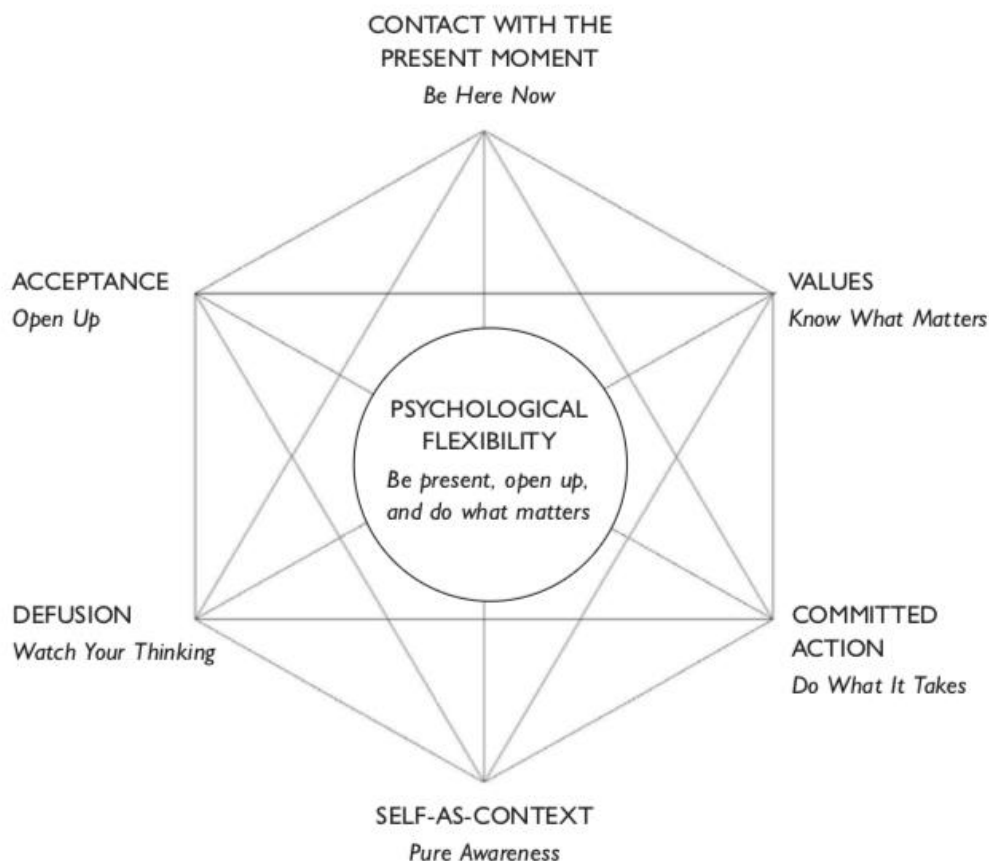
potentially more effective than CBT in supporting patients in the final stages of life (Branstetter et al., 2004) is Acceptance and Commitment Therapy (ACT).

### **Acceptance and Commitment Therapy (ACT)**

ACT seeks to foster psychological flexibility in relation to one's internal experiences including, thoughts, feelings, and physical sensations (Hayes et al., 1999). Emphasis is placed upon changing the relationship with difficult thoughts rather than the content. The psychological flexibility required to do this is understood to comprise of six core interrelated processes as presented in the 'Hexaflex' model (Figure 2) (Wilson & DuFrene, 2009). Psychological flexibility within this context is the ability to adapt and make value consistent choices amid difficult situations, such as being diagnosed with cancer. Each of the six interrelated processes can be built upon through different techniques. Patients living with cancer can be supported to connect with the *present moment* through a series of mindfulness techniques, building present moment awareness allows patients to focus on what they can control rather than dwelling on internal experiences (Mosher et al., 2021). *Acceptance* encompasses opening up to difficult internal experiences and allowing oneself to have these experiences. Acceptance should not however be conflated with self-defeat or giving up (Hayes & Smith, 2005). From an ACT perspective, distress is triggered and maintained through cognitively fused thoughts, with interventions therefore focusing on weakening the influence that negative cognitions have over someone's behaviour through the practice of cognitive defusion (Hayes et al., 2013). Relatedly, thoughts and internal experiences are seen as separate to the self and patients are supported to see the disconnect. For people living with cancer this approach can be particularly relevant and may involve working on separating feeling unwell from being unwell (Hulbert-Williams et al., 2015). Through connecting with values, individuals can explore a new 'normal' and incorporate their own experience of living with cancer into their sense of self. Living in line with values through committed action, means that difficult experiences can be accepted with greater ease due to realising that values are maintained regardless (Hayes & Smith, 2005).

**Figure 2**

*ACT “Hexaflex”*



*Note.* Image from “*ACT made simple: An easy-to-read primer on acceptance and commitment therapy*”. Harris (2009), p. 10, Oakland, CA: New Harbinger Publications, Inc. Copyright 2009 by New Harbinger Publications, Inc.

ACT proposes that psychological distress is normal and best not considered a sign of ill-health (Hayes & Smith, 2005). This stance has important parallels with oncology research which recognises that an adverse emotional reaction in response to diagnosis and treatment is not abnormal (Hulbert-Williams et al., 2015). Whilst only a relatively small number of studies have specifically studied the use of ACT within oncology, encouraging outcomes in terms of reductions in emotional distress, physical pain, traumatic responses and increased psychological flexibility and QoL have been found (Fashler et al., 2018). ACT is thought to be particularly well suited to the idiosyncratic nature of adjusting to life after a cancer diagnosis (Hulbert-Williams et al., 2015). Encouraging outcomes were additionally found by Rost et al. (2012) who demonstrated significant improvements in anxiety, depression and QoL post intervention with large effect sizes. Significant improvements in psychological distress and QoL were also found by Feros et al. (2013).

Promisingly, ACT has been shown to offer clinical benefits for a range of patients, irrespective of psychological comorbidities (Hulbert-Williams et al., 2015).

It is noteworthy however that much of the ACT-based research within long term conditions is frequently criticised in terms of its lack of methodological rigor, with the need for further studies well recognised. One such criticism relates to the use of wide-ranging outcome measures and doses of interventions, rendering any across study comparisons in relation to effectiveness particularly challenging (Williams & Dale, 2006). Additionally, the format through which ACT-based interventions are delivered is an area warranting further research (Hulbert-Williams et al., 2015), and reflects a lack of studies generally within oncology that have looked at the effectiveness of different intervention implementation strategies (Trevino et al., 2018). It has been argued that the methodological shortcomings of ACT studies are particularly evident when compared against traditional CBT-based studies (Ost et al., 2008). However, the appropriateness of holding ACT-based studies to the same methodological standards despite the two approaches following a different model of scientific development is debatable. Further, notwithstanding ACT-based research being relatively underfunded, research findings thus far are encouraging and can hold their own when compared to alternative approaches (Hayes et al., 2013).

### **Online interventions**

There is a recognised need for improved access to effective and acceptable psychological interventions within this population (MacMillan, 2015). The difficulties that present when trying to ensure adequate access to psychological support for the cancer population were particularly highlighted during the Covid-19 pandemic whereby oncology services were significantly disrupted (Swainston et al., 2020). People living with cancer were at greater risk of serious health complications from contracting the virus (Zhang et al., 2020) and subsequently in-person interventions, particularly group-based approaches, increased the likelihood of exposure and subsequent risk to health. Whilst the consumption of information and communication technologies began prior to the Covid-19 pandemic, the national health crisis resulted in an exponential increase in the use of digitalised psychological therapies (Dores et al., 2021). Greater utilisation of web-based support may be particularly advantageous within oncology, especially within



financially stretched services (Hulbert-Williams et al., 2014) and may serve to lessen barriers that make accessing psychological support more difficult such as geography, time, and mobility (Griffiths et al., 2006). Further, web-based interventions have been shown to be effective in reducing psychological distress and the impact of symptoms in LTCs (Lin et al., 2017), and to associate with improved psychological and physical wellbeing within oncology settings (Corbett et al., 2018). However, despite the potential for online interventions to address an important gap within cancer care, there continues to be a lack of evaluative studies (Leykin et al., 2012).

### **Measurement issues and assessment of QoL**

As discussed within the systematic review, greater consensus on the types of measures being utilised to assess psychological constructs is required (Niedzwiedz et al., 2019). Working to ensure greater measurement unity across studies is an important step in ensuring the most important outcomes are being measured accurately and consistently across studies. This holds particularly true in the QoL domain (Bradley, 2001) which has been identified as a primary outcome by NHS England. Whilst the importance of measuring QoL within this population is accepted (Mckenna, 2011), at present, a range of generic and cancer-specific measures are frequently used. The utilisation of measures such as the EQ-5D (The EuroQol Group, 1990) and SF-36 (Ware & Sherbourne, 1992), which conflate general QoL with health status, is common practice (Garden et al., 2022). Similarly, cancer-specific measures such as the Functional Assessment of Cancer Therapy (FACT; Cella et al., 1993) and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30 items (EORTC-QLQ-C30; Aaronson et al., 1993) contain items which focus primarily on health symptoms or functional status. Furthermore, these measures do not account for the extent to which the items are relevant and important to those completing the measure (Garden et al., 2022). According to Joyce (1994), QoL is best defined as *‘how good or bad a person feels their life to be’* and measurement of QoL therefore needs to consider how important each aspect of life is to the individual’s QoL. The Cancer Dependent QoL (CancerDQoL) questionnaire is a new individualised measure which was developed to assess the holistic impact of cancer and its treatment on a person’s QoL. The measure has been established as having face and content validity (Garden et al., 2022).

Psychometric evaluation of the CancerDQoL has shown it to have a robust single factor structure and excellent internal consistency reliability (Davidson et al., in press). Preliminary support was also found for the discriminant and construct validity of the CancerDQoL. As well as assessing aspects of life that are most relevant to the patient population, scoring of the CancerDQoL is individualised, and recognises that different aspects of life are relevant to different individuals and vary in terms of their importance for QoL (Davidson et al., 2022). The CancerDQoL was utilised within the present study to assess QoL

### **Aims of the present study**

Despite the promise of online interventions and the appropriateness of ACT-based interventions within this population, to our knowledge research has not examined the acceptability and preliminary effectiveness of a web-based ACT intervention in adults living with cancer. In addition, a unique aspect of this study was to use an individualised measure of QoL. The present study sought to contribute to the gap in the existing literature by developing a web-based ACT intervention for people living with cancer and examining the effectiveness of the approach on patient reported outcomes and ACT processes over time. Additionally, the study sought to examine whether post-intervention, changes in outcome remained, improved, or deteriorated compared to baseline.

The following hypotheses were proposed:

1. The web-based ACT intervention will be acceptable and feasible for use within this population.
2. The intervention will lead to post-intervention improvements in self-reported cancer specific QoL, psychological (anxiety and depression), physical (impact of pain and fatigue) and mindfulness outcomes.
3. Changes in ACT processes (i.e., psychological flexibility) will be found post-intervention.
4. Changes will be maintained at one-month follow-up.

## **Method**

Ethical approval was acquired from the Research Ethics Committee at Royal Holloway University of London in April 2021 (Appendix A).

### **Design**

An A1BA2 multiple-baseline SECD with randomised allocation to baseline was implemented. “A1” denoted the varying baseline phase with lengths of either 1, 2 or 3 weeks; “B” comprised of the intervention phase which entailed the six-week online cancer-specific ACT intervention; A2 was a four-week follow-up phase to monitor for sustained outcome change post-intervention.

### **Participants**

A total of 6 participants (3 males, 3 females) completed the study. Participants were recruited through the Maggie’s Cancer Centre at The Royal Marsden Hospital, London and via adverts posted on social media. Recruitment took place between September 2021 and February 2022.

### **Power**

In single case experimental design studies, power is derived from repeated measurement within participants, rather than from the number of participants (Krasny-Pacini & Evans, 2018). Studying fewer participants, but more intensely, enables a greater level of understanding in terms of treatment effects (Normand, 2016). Shadish et al. (2014) proposed a minimum of eighteen time points per phase for a multiple-baseline power of 0.9 with five participants. Additionally, to establish experimental control across participants three effect replications are required (Horner et al., 2005; Lanovaz & Rapp, 2016). Therefore, three study participants are considered sufficient to draw reliable conclusions when using SCED (Krasny-Pacini & Evans, 2018). Allowing for attrition and in accordance with other SCED evaluating novel technology-based health interventions (Dallery et al., 2013), this study sought to recruit six participants.

### **Eligibility**

Eligible participants met the inclusion criteria of being at least 18 years old, having access to the internet, being fluent in written and spoken English, and scoring  $\geq 3$  on the screening questionnaire (See Measures) indicating cancer-related psychological distress. Participants additionally satisfied one of the

following criteria: completed treatment for cancer within the last 18 months, currently receiving cancer treatment, or due to start cancer treatment imminently. People were not eligible to participate if they were receiving psychological support elsewhere, had a diagnosed psychiatric condition or cognitive impairment or if they were diagnosed with a life-threatening physical condition other than cancer.

### ***Recruitment***

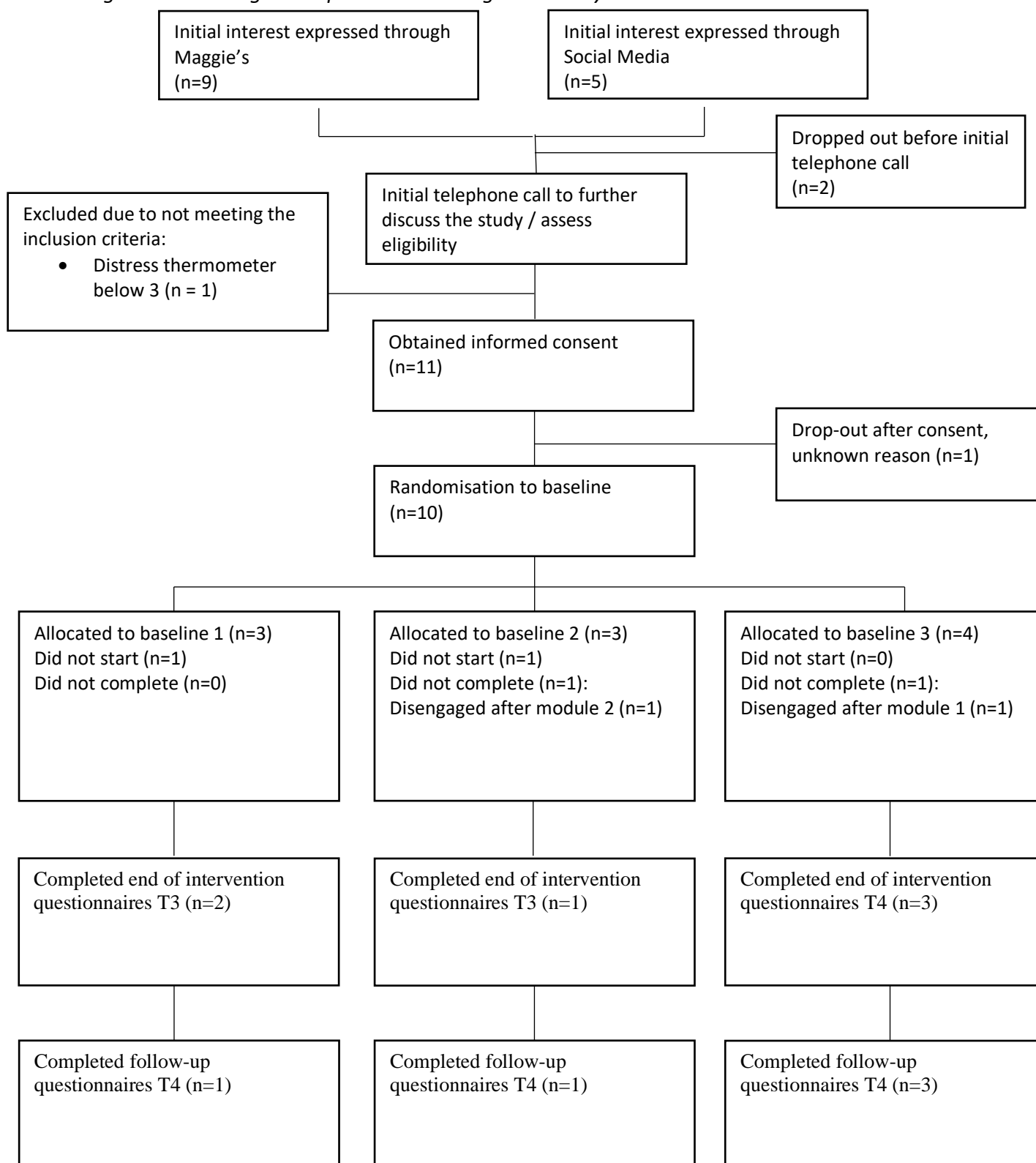
Participants were recruited primarily through the Maggie's Cancer Centre at The Royal Marsden Hospital, London. The primary investigator (PI) attended three remote meetings with clinical psychologists at Maggie's to talk about the study and acquire feedback on the intervention. Prior to recruitment, the PI joined an additional online meeting with Maggie's staff to talk to the wider team about the study and recruitment process. Potentially eligible participants were identified by the team at Maggie's and were given a copy of the participant information sheet (Appendix C). A flyer advertising the study (Appendix B) was also displayed within the centre to help raise awareness of the project amongst visitors. Potential participants were able to contact the PI directly using contact details provided on the flyer or participant information sheet, or alternatively they could complete a reply slip consenting for their contact details to be shared with the PI. Sampling sought to include a range of demographic characteristics and cancer diagnoses to increase the generalisability of the findings. A total of nine potential participants were recruited through this route.

To supplement recruitment, from October 2020 the flyer was shared online through social media Facebook posts via the PI's Facebook and Instagram account. The flyer was also shared on these online platforms by the PI's family and friends and posted within Facebook cancer support groups. A total of five people expressed interest participate in the study via social media.

Two potential participants (14%) dropped out before eligibility was assessed and one person (7%) was not eligible to participate due to not meeting inclusion criteria. Overall, eleven participants provided informed consent (Appendix D) to participate in the study, ten of these were randomised to baseline after one person dropped out before allocation occurred.

**Figure 3**

*Diagram Illustrating Participant Flow Through The Study*



## **Measures**

Six types of outcome measure were collected: socio-demographic information, screening questionnaire, idiographic measures, standardised questionnaires, process measures and feedback questionnaire. All measures were completed online through electronic copies via the Qualtrics platform.

### ***Sociodemographic measures***

Sociodemographic characteristics and clinical information relating to cancer diagnosis and treatment were obtained via self-completion through an online form adapted from a questionnaire used in previous research with people living with cancer (Davidson, 2020; Davidson et al., in press); Appendix E).

### ***Screening measure***

The National Comprehensive Cancer Network (NCCN) Distress Thermometer (DT) (Bulli et al., 2008) is a one item measure through which participants denote the extent of their cancer-related distress over the week prior to assessment. Participants are presented with an 11-point Likert scale (0 = 'no distress' to 10 'extreme distress'). Higher scores indicate greater levels of cancer-related distress with a cut-off point of 3 indicating clinically elevated levels of distress (Cutillo et al., 2017). The DT has shown acceptable levels of test-retest reliability ( $r=0.80$ ,  $P<0.001$ ) and high levels of diagnostic accuracy in that it is able to differentiate distressed participants from those who are not distressed (Tang et al., 2011). Participants scoring higher than the clinical cut-off were considered eligible to participate in this study (Appendix K).

### ***Idiographic Measures***

Idiographic measures sought to collate information on self-reported mood, anxiety, pain, fatigue, and mindfulness. Participants were presented with daily idiographic measures comprising of five non-standardised visual analogue scales (VAS) (Appendix I). The validity and reliability of single-item VAS measures is well recognised (Douglas et al., 2020), with their simplicity and suitability frequently favoured within single case experimental designs (SCED) to measure the intensity and frequency of various symptoms (Paul-Dauphin et al., 1999). Specifically, VAS measures are recognised to have acceptable construct validity due to their focus on specific relevant individual behaviours or subjective states of interest, rather than focusing on constructs (Morley, 2017). Additionally, VAS measures are known to be

particularly sensitive to symptom change (Brazier & Ratcliffe, 2017) and have been utilised effectively in the assessment of a substantial number of health-related constructs (Williams et al., 2010). Participants were asked to complete these measures as close to daily as possible to achieve adequate power of 0.8 (Shadish et al., 2014) and were encouraged to report in an additional box any external factors that may have influenced their responses.

VAS measures were presented to participants using a four-point answering format with scores ranging from 0 'not at all' to 3 'very much so'. A four-point system was adopted due to the high mental effort associated with rating systems where five or more labels are used (van Laerhoven et al., 2004). VAS assessed low mood ("Please rate how upset and/or downhearted you were today overall"); anxiety ("Please rate how anxious/and or worried you were today overall"); daily levels of pain ("Over the past 24 hours I have been bothered by pain related to cancer and it's treatment") and fatigue ("Over the past 24 hours I have been bothered by fatigue related to cancer and it's treatment"). Participants were also asked to rate the extent to which they had been psychologically present over the past 24 hours ("I spend a lot of time thinking about the past or future, rather than being engaged in activities that matter to me").

### ***Standardised Measures***

*The Hospital Anxiety and Depression Scale* (HADS; Zigmond & Snaith, 1983) is a 14-item scale. Items are rated on a 4-point Likert scale (0 = 'most of the time'; 3 = all of the time) with two subscales of seven questions each measuring anxiety and depression. A sum score ranging from 0 to 21 can be calculated for each subscale, with higher scores denoting greater anxiety or depression levels. The HADS has been used to assess emotional states within the cancer population previously (Annunziata et al., 2019) and demonstrated good internal consistency reliability for both the anxiety subscale ( $\alpha=.79$ ), the depression subscale ( $\alpha=.87$ ) and the overall scale ( $\alpha=.85$ ) (Rodgers et al., 2005). Previous studies have reported significant convergent correlations with scales of cancer-related distress ( $r = 0.51-0.71$ ) (Hyland et al., 2019).

*The Cancer Dependent Quality of Life questionnaire* (CancerDQoL; Garden et al., 2022) is an individualised cancer-specific quality of life measure. The measure encompasses twenty-seven items four

of which are overview items measuring general QoL, cancer-dependent QoL, general health and cancer-dependent health. Twenty-three domain specific items are rated in terms of both impact (e.g. -3 = very much better to +1 = worse) and importance (3, very important, to 0, not at all important), through multiplying these ratings a weighted impact (WI) score can be calculated for each item (-9 = greatest negative impact to +3 = greatest positive impact). This provides an individualised measure of the cancer-related impact of each domain weighted by the importance of that domain for the person's QoL. Eight items also have a 'not applicable' response option. An overall average weighted impact (AWI) score can then be generated by calculating the mean WI score from all applicable domains. There is a free text box for respondents to indicate any other ways in which cancer or its treatment impacts on quality of life. The CancerDQoL is an adaptation of the well-established Audit of Diabetes-Dependent Quality of Life (ADDQoL) questionnaire for people with diabetes (Bradley et al., 1999) and has been found to demonstrate both face and content validity (Garden et al., 2022). Psychometric analyses found CancerDQoL AWI scores were positively correlated with the general quality of life overview item ( $r = .395$ ,  $p < .05$ ) and more strongly correlated with the cancer-dependent quality of life overview item ( $r = .698$ ,  $p < .05$ ) (Davidson, 2020; Davidson et al., in press) suggesting the measure can discriminate between general QoL and the impact of cancer on QoL.

The *Multidimensional Psychological Flexibility Inventory* (MPFI; Rolffs et al., 2018; Appendix G) is a 60-item measure of the twelve dimensions of the Acceptance and Commitment Therapy (ACT) Hexaflex model across two subscales. The MPFI Flexibility subscale measures the processes of: Acceptance, Present Moment Awareness, Self as Context, Defusion, Values, Committed Action. The MPFI Inflexibility subscale comprises of: Experiential Avoidance, Lack of Contact with the Present Moment, Self as Content, Fusion, Lack of Contact with Values, Inaction. Items are rated on a 6-point Likert scale (e.g. 1 = 'never true'; 6 = 'always true') and composite global scales can be calculated for each subscale: Global Flexibility and Global Inflexibility. These constructs have been shown to be distinct but moderately correlated ( $r = .34-.65$ ; Rogge et al., 2019). The MPFI has demonstrated excellent internal consistency reliability ( $\alpha = .96$ ) and good convergent and discriminant validity (Rolffs et al., 2018).



### **Feasibility and Acceptability:**

Feasibility was assessed in terms of recruitment and retention rates, considering whether it had been possible to achieve the specified recruitment target within the study time frame and reviewing participant retention rates in relation to similar studies within oncology. Acceptability was considered through qualitative feedback acquired through informal check-in telephone calls and through a questionnaire based on the Client Satisfaction Questionnaire (CSQ-8; Larsen et al., 1979). The CSQ-8 consists of eight self-report items which are responded to on a 4-point Likert scale. A sum score can be calculated from between 8-32 with higher scores equating to greater satisfaction. The CSQ-8 has been found to demonstrate excellent internal reliability ( $\alpha=.83-93$ ) and good validity ( $r=.60-.80$ ; Larson et al., 1979). Additional items were added to the questionnaire in relation to user-friendliness and the appropriateness of the intervention (Appendix J).

### **Intervention Development**

The content and structure of the web-based intervention (Appendix L) was informed by the *ACT for living with diabetes online intervention* (Somaini, 2021), *ACT Made Simple* (Harris, 2009) and the *Reclaiming Life Support Group* manual (Taylor & Smith, 2013). The intervention was facilitated through Qualtrics, a secure online platform which is frequently used within psychological research and can be accessed from any electronic device.

The intervention comprised of six modules and utilised the 'Passengers on a Bus' metaphor (Hayes et al., 1999) as a running thread throughout. The metaphor invites participants to start thinking about their own internal experiences through introducing the idea that we begin to pick up "passengers" from the moment life begins. These "passengers" derive from our unique life experiences and symbolise thoughts, feelings, memories, beliefs, sensations etc. The road represents the external factors: the situations and people that we encounter as we go through life. Whilst some passengers are appreciated guests or guests that are benign, others are unwelcome and may influence the direction of the bus in an unwanted way. We may struggle with unwanted passengers and develop unhelpful strategies to convince them to stay at the back of the bus. The time invested in struggling with these passengers is time that could be reinvested into

driving the bus in a meaningful life direction. This metaphor is used to highlight the active role of the bus driver and that through building a novel relationship with one's challenging internal experiences, valued actions can be prioritised.

Module 1 described the impact that cancer can have on one's internal and external experiences and participants were introduced to ACT as an approach through watching an embedded video of the *Passengers on a Bus metaphor* (Oliver, 2013). Participants were invited to take part in the "Mindfulness of the Breath" exercise through an embedded recording. This exercise sought to support participants to become aware of their own internal experiences in the present moment and focused on attending to the sensations of breathing.

Module 2 encouraged participants to reflect upon their relationship with the more difficult thoughts and feelings that can arise after a cancer diagnosis and the impact on QoL. The skill of defusion was introduced and participants were invited to listen to an audio recording of the "Leaves on a Stream" imagery exercise. Through the exercise, participants were encouraged to notice and let go of any thoughts that appeared, without struggling with them, by placing them on leaves and watching them float away on the stream.

Module 3 focused on the concept of acceptance and how this may relate to cancer. This module acknowledged that acceptance is often considered a passive notion and instead asked participants to consider acceptance as an active willingness to allow difficult experiences to be there without fighting with them. The 'Tug of War with a Monster' metaphor was used to help illustrate the concept of acceptance. This module finished by presenting participants with a recording of a mindfulness-based exercise which sought to aid the development of acceptance skills through choosing a challenging internal experiencing and opening up to this experience.

Module 4 was focussed on values. Participants were supported to reflect upon the way in which what is valued can change following a cancer diagnosis and how one's values can help to guide bigger life decisions. To reflect upon their own values, participants were invited to complete a value card-sort task in which they sorted twelve value cards in terms of how important they perceived the value to personally be:

‘very important’, ‘quite important’, ‘not important’. To finish the exercise, participants were asked to choose one value that they felt was ‘very important’ to focus on for the coming week and were encouraged to write down why that value was meaningful to them.

Module 5 focused on using participant’s previously identified values to set value-based goals. Participants were presented with information and examples to aid them in setting their own “SMART” (specific, measurable, achievable, realistic, and time-limited) goals. Participants were supported to develop a value informed goal and to break this goal down into smaller achievable steps for the coming week.

Module 6 considered common obstacles that can arise when trying to take steps towards achieving value-based goals and invited participants to reflect upon what barriers may come up for them personally. Participants were subsequently invited to think about how they may overcome these challenges. To finish the module, the acronym “AWARE” (Practice Accepting, Watch the here and now, Act in line with values, Repeat, Expect to experience challenging internal events) was introduced which brought together the different skills learnt through the modules.

The embedded audios were scripts adapted from Harris (2009) and recorded by the PI. Participants were supported to reflect upon the exercises presented in modules 1, 2 and 3 by four questions. These questions sought to facilitate reflection on how it felt to take part in the exercises and consider the ways in which the skills may impact upon living with cancer. Copies of the recordings were emailed upon completion of each module so that participants could practice weekly 3-4 times.

## **Procedure**

Participants who were identified as being eligible to participate by Maggie’s staff were told about the study and given a copy of the participant information sheet. Interested participants either contacted the PI directly or completed a reply slip consenting for the PI to contact them. All participants were given the opportunity to have questions about the study answered and were asked to complete the screening questionnaire. Eligible participants who consented to participate were assigned a random unique identification number and received an automated email with a link to access the sociodemographic form and standardised measures (T1). A letter was sent to each participant’s General Practitioner informing

them of their patient's participation (Appendix M). Participants were randomly allocated to varying baseline lengths of either 1, 2 or 3 weeks through a randomiser function embedded in the survey flow. Randomisation to baseline sought to minimise extraneous threats to internal validity through maturation. Participants were made aware of their baseline group immediately through the programme and via email shortly afterwards. Participation comprised of the following stages:

Baseline (A): Participants were asked to complete standardised measures (T1) and were allocated to baseline length. Idiographic measures were shared with participants via an email link and were for completion as close to daily as possible. Participants received a daily email reminder to complete the measures.

Intervention (B): following completion of the baseline period, participants received an automatically generated email containing a link through which to begin the intervention. Prior to being presented with module 1, participants were asked to complete standardised measures alongside the process measure (T2). Participants continued to complete daily idiographic measures throughout the intervention phase. Upon module completion, participants received an email containing a reminder of the task for the week and a copy of any exercise materials from the module. Module links were automatically sent to participants after seven days from submission of the previously completed module. Participants were invited to complete each module in one sitting each week and on the same day each week where possible. Participants were offered flexibility in terms of when they chose to complete the modules (e.g. mornings, weekends), which meant that finishing the programme took longer than six weeks for some of the participants. Upon completion of the modules, participants completed standardised measures and process measures (T3). Feedback on the intervention was sought through anonymous feedback from which was automatically sent upon completion of the final module.

Follow up (a): During the four-week follow-up period, participants were invited to continue to complete the daily idiographic measures. Standardised measures and process measures were completed one final time at the end of the four weeks (T4). Upon study completion, participants were entered into a prize draw to win one of two £50 amazon vouchers.

Participants were offered three check-in calls lasting approximately 10 minutes. The first scheduled telephone call took place at the beginning of baseline with the view of further exploring eligibility to participate (e.g. in terms of time passed since finishing treatment) and anticipating and managing any barriers to engagement (e.g. limited time during the Christmas period). Participants were reminded during the call of the different stages to follow throughout the study (completion of daily VAS measures, one module per week and standardised questionnaires at predetermined time points), the amount of time they might expect to wait before beginning the intervention and of the email reminders they would receive. Participants were then offered a second call half-way through the intervention to check in on any barriers to engagement and completing the study.

A third call was offered to participants after completion of the sixth module to ascertain qualitative feedback on the intervention and explain the process for the follow-up period. It was explained to participants that they could also contact the primary investigator at any point throughout the study if they experienced any difficulties with the intervention personally or technologically. The availability of the PI was made clear to participants to enhance engagement with the online intervention and reduce attrition rates (Fernandez-Alvarez et al., 2017).

### ***Service-User Involvement***

An individual who was not eligible to participate in the study, expressed interest in being consulted and agreed to provide feedback on the patient information sheet and consent form. The same service user agreed to pilot the intervention which consisted of filling in the questionnaires, working through each of the modules and completing the idiographic measures. Feedback was sought on the appropriateness of the module content, accessibility, and user friendliness of the intervention. Stemming from the service user feedback, changes were made to include more examples throughout the intervention (e.g. when talking about setting SMART goals). Additionally, the service user advised on things that may be helpful to talk to participants about prior to beginning the intervention (e.g., to normalise some of the challenging feelings that may come up from completing the idiographic measures). This feedback helped to inform the three telephone call conversations that were offered to participants.

## Data Analysis

### *Idiographic data*

In accordance with recommendations (Morley, 2017), both visual analysis and Tau-U statistic were utilised in the analysis of idiographic VAS data (Gast, 2005). Fundamental to the interpretation of SCED VAS data, visual analysis allows for the relationship between an independent variable and outcome to be examined through noting the occurrence of data patterns within and between phases (Kratochwill et al., 2013). In accordance with recommended practice (Lane & Gast, 2014), participant VAS data was plotted and displayed using line graphs.

To help ensure replicability and lessen the subjectivity of interpretation, the following parameters were considered for visual inspection (Morley, 2017):

- 1) Change in the central tendency: Observable differences in the average score of data across phases.

Morley (2017) suggests the use of the broadened median (BMed), to help improve the estimate of central tendency in small data sets and reduce the impact of outliers. As per Rosenberg and Gasko's (1983) guidelines, BMed was computed prior to beginning visual analysis.

- 2) Variability: The variation of data points within a phase.
- 3) Data trend: changes in the direction of the data trend line. In instances where data is likely to be highly variable, Morley (2017) suggests smoothing the data using running medians. Running medians of four averaged by pairs were calculated and used to visually explore data trend.
- 4) Changes in the level of data: differences in the pattern of data between the end point of one phase and the beginning of the next.
- 5) Data non-overlap: the amount of data from one phase that does not overlap with data from the next phase (e.g., baseline data compared to intervention phase data).

To suggest a change in the data pattern has resulted from the introduction of the intervention, an observable stable and predictable baseline trend, or a trend in the opposite direction of expected change is favourable (Kratochwill et al., 2013). To satisfy the study hypothesis, changes in the following adjacent phases would be required: a decrease in central tendency and downward trend on low mood, anxiety,

pain, fatigue, and an upward trend in mindfulness VAS; negligible data overlap between phases; a change in level. These parameters taken together formed the criteria through which to evaluate whether there was evidence of three effect replications across the data of at least three participants. If three effect replications across at least three participants are observed, it can be argued that the change in the outcome is related to the manipulation of the independent variable (Kratochwill et al., 2013). Within multiple baseline designs it is possible to argue for the presence of an intervention driven effect by comparing across participants. For example, if one participant had completed the first three modules of the intervention, whilst another was in the baseline phase, in order to argue that the intervention was impacting upon the outcome variable, you would only expect to observe an effect for the participant completing the modules.

Tau-U test statistic was calculated to substantiate visual analyses. Tau-U was calculated using an online calculator ([www.singlecaseresearch.org/calculators/tau-u](http://www.singlecaseresearch.org/calculators/tau-u)) and combines the nonoverlap between phases whilst correcting for baseline trend (Parker et al., 2011), subsequently permitting greater accuracy of pre and post intervention phase comparisons (Manolov et al., 2014). A negative trend in participant data is indicated through a negative Tau-U value (Morley, 2017). Comparisons were made between A x B to assess improvements in outcome which occurred following the introduction of the intervention; between B x a to assess whether any further changes were made at one month follow-up. Tau-U does not permit contrasts for non-adjacent phases (Morley, 2017), subsequently A x (B + a) was assessed, bringing together the intervention and follow up phases to assess the overall impact of the intervention over time in comparison to baseline (Parker & Vannest, 2012).

VAS data were initially considered individually. For each VAS variable where a minimum of three significant effect replications were found, single omnibus Tau-U effect sizes were calculated using weighted averages, presenting the extent of data non-overlap for that VAS variable across participants.

### ***Standardised Data***

To examine differences between pre intervention and post intervention scores, standardised data acquired between T1-T4 was analysed in terms of reliable change (RC) and clinically significant change

(CSC) for each participant. Reliable change index (RCI) was used to assess whether any changes in scores were statistically reliable as opposed to occurring due to measurement error (Jacobson & Traux, 1992). An excel calculator was used to compute RCI by dividing the difference in scores pre-intervention and post-intervention by the standard error of the difference (Morley & Dowzer, 2014). For each standardised measure, Cronbach's alpha scores were provided denoting internal reliability. Differences in scores were recognised as being reliable ( $p < .05$ ) in instances where an RCI was greater than  $\pm 1.96$  (Jacobson & Truax, 1992). In instances where reliable change was evidenced, an excel calculator (Morley & Dowzer, 2014) was utilised to calculate CSC. When considering the significance of change, Jacobson and Traux (1992) suggest any change is held up against the following criteria: 1) scores acquired post intervention sitting 2 standard deviations (SD) outside of the clinical range; 2) post-intervention scores sitting within 2 SD of the non-clinical range. 3) post intervention scores sitting closer to the non-clinical population mean rather than that of the clinical population. Jacobson and Truax (1992) suggest the use of the last two criteria in instances where norms for both clinical nonclinical populations are accessible. In instances where a non-clinical comparison is not accessible, the use of criterion one is recommended. In accordance with recommendations, the HADS measure utilised within this study was held up against criterion two and three. Criterion one was utilised when looking at QoL due to the measure being cancer specific, without the availability of non-clinical normative data for comparison. RCI and CSC reference data can be seen in Appendix N.

### **Process Data**

To be able to detect clinically reliable change on the MPFI Global Flexibility and Global Inflexibility composites (Rolffs et al., 2018) collected at T2, T3 and T4, the Minimal Detectable Change index statistic (MDC95; Stratford, 1996) was utilised. For reliable change to be indicated, an increase in participant global flexibility scores by a MDC95 value of 1.10 was needed between T2-T3 and T2-T4. Global inflexibility however was required to decrease by a MDC95 score of .84 (Rolffs et al., 2018).



## Results

Participant demographics and results in relation to the feasibility and acceptability of the web-based ACT intervention will be initially presented. Proceeding this, data pertaining to the preliminary effectiveness of the intervention will be presented through the visual and statistical analysis of individual ideographic measures. Lastly, the analysis of the standardised and process data will be presented.

### Demographics and Cancer Characteristics

Anonymity was supported by referring to all participants within the study by the letter “P” and assigning a subsequent number ranging from 1-6. Some information presented in Table 4 has also been changed to uphold anonymity. The study was completed by three females and three males, with an average age of 62.5 years (SD= 7.27) and all were from a white background. All participants had been previously diagnosed with cancer and were receiving treatment (n=2) or had done so within the last 18 months (n=4). A range of different cancer types were reported, including Lymphoma, prostate, lung, breast, and skin cancer. Stage of cancer ranged from 1 (n=1) to 4 (n=2), three participants chose not to report stage. Most participants (n=4) reported that the cancer was in remission. Half of the participants (n=3) were retired with cancer having impacted upon the employment status of one participant. Two participants reported co-morbid health problems due to cancer. Sociodemographic and cancer characteristics are presented in Table 4.

**Table 4**

*Socio-demographic and Cancer Characteristics*

	P1	P2	P3	P4	P5	P6
<b>Gender</b>	Male	Male	Female	Female	Female	Male
<b>Age</b>	65-75	65-75	55-64	55-64	55-64	65-75
<b>Ethnicity</b>	White British	White British	White British	White British	White British	White British
<b>Marital status</b>	Married	Married	Single	Single	Married	Married
<b>Years in education</b>	17	17	14	14	14	17
<b>Employment status</b>	Retired	Retired	Working full time	Working full time	Working full time	Retired

<b><i>Time since diagnosis</i></b>	>12 months	>12 months	>12 months	>12 months	< 12 months	< 12 months
<b><i>Treatment type</i></b>	Surgery	Surgery	Chemotherapy	Chemotherapy	Chemotherapy	Surgery
<b><i>Treatment stage</i></b>	Completed	Completed	Ongoing	Ongoing	Ongoing	Completed

---

## Feasibility and Acceptability

The initial aim was to ascertain whether the intervention was feasible and acceptable for people living with cancer. To determine this, rates of recruitment and retention were examined in addition to the quantitative and qualitative feedback acquired post-intervention.

In terms of intervention feasibility, the recruitment target of six participants completing the intervention was achieved. The number of eligible participant referrals was lower than the anticipated 30 participants. Of those eligible there was a high uptake of participants going on to complete the intervention (n=6, 55%). Of those who started the intervention 25% dropped out (n = 2).

Ratings on the CSQ-8 indicated that most participants found the intervention to be highly acceptable. Ratings varied between 56% -100% (Appendix O, Table O1). Overall, four participants reported being highly satisfied with the intervention, said that they would recommend it to a friend and reported that it helped them to deal more effectively with their problems. One participant reported that they would not return to the intervention in the future. Further feedback regarding the user-friendliness of the intervention suggested that most participants found the information to be generally easy to understand, clear in meaning, informative and that the programme was easy to access and user friendly (Appendix O, Table N2).

Qualitatively, feedback highlighted the use of analogies and exercises (e.g. 'The bus metaphor brought the idea to life' and 'I really liked the leaves on a stream exercise and kept coming back to it), and the goal setting module (e.g. 'I found goal setting module really clear and it helped me to plan') as particularly beneficial aspects. Participants reflected upon at which point post-diagnosis they thought the intervention would be most helpful, with two participants advocating for the earlier stages post-diagnosis (e.g., 'this would have been really useful when beginning treatment, when my life was turned upside down' and 'when immediately diagnosed I felt very alone and think this programme would have been very

helpful’). The aspects that participants reported finding the least helpful related to the study design, with two participants reporting finding the daily VAS measures unhelpful and one participant reported they would have preferred face-to-face contact rather than online.

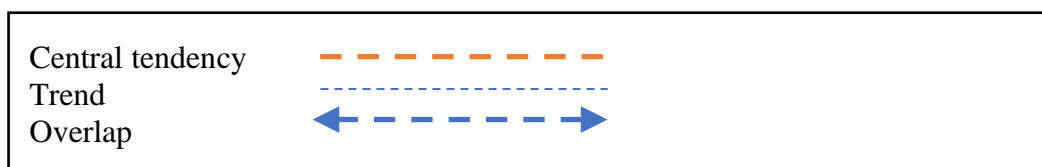
## Idiographic Results

### *Psychological Outcomes*

Participant VAS data is presented for each phase in the line graphs below. Continuous black lines are used to depict the raw data with black dots signifying data points. Each data point is labelled on the horizontal axis to indicate phase with a letter; “A” equates to baseline, “B” for intervention, “a” to indicate the follow-up period. A numerical value is additionally assigned to each data point to correspond to the number of the data entry for each phase. Central tendency, trend and data overlap between intervention phases are indicated by additional lines (Figure 4). Phase change is visually represented with black dashed vertical lines. Participant graphs and findings are discussed in order of overall significance.

**Figure 4**

*Line markers key*



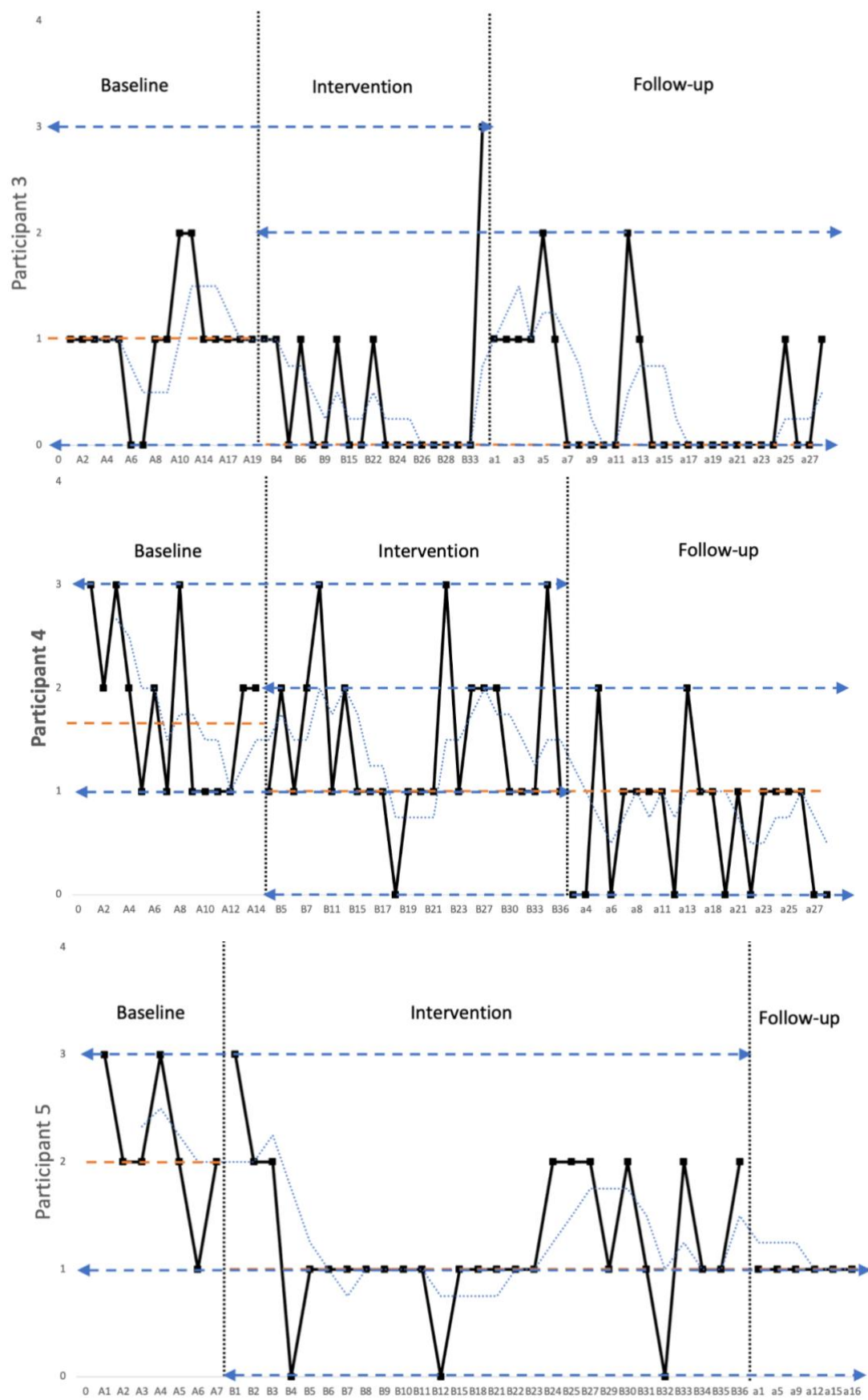
The baseline phase would ideally conclude once data stabilisation is evident (Kazdin, 2019), a priori randomisation to baseline lengths meant that this was not possible in this study. The number of data points acquired within the baseline phase varied from a minimum of 7 (P2) to a maximum of 20 data points (P6). The number of baseline data points were considered to be within acceptable limits (Turpin, 2001). There were a number of confounding variables worthy of acknowledgement: P1 reported significant ongoing life stressors throughout completion of the study, P6 completed several of the of the daily measures retrospectively, P5 completed under half of the VAS measures during the follow-up period, hampering the visual analysis for that phase of the study.

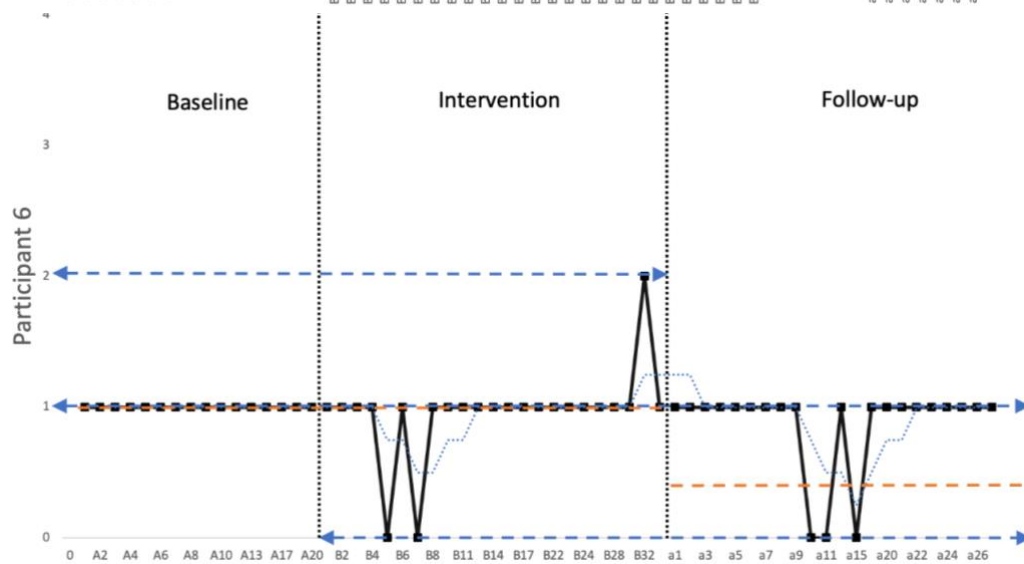
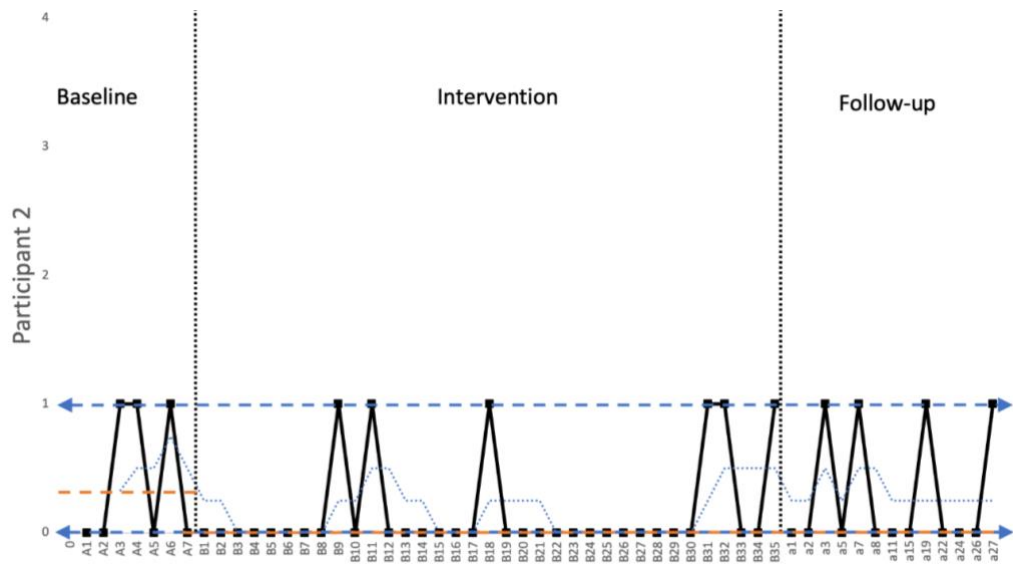
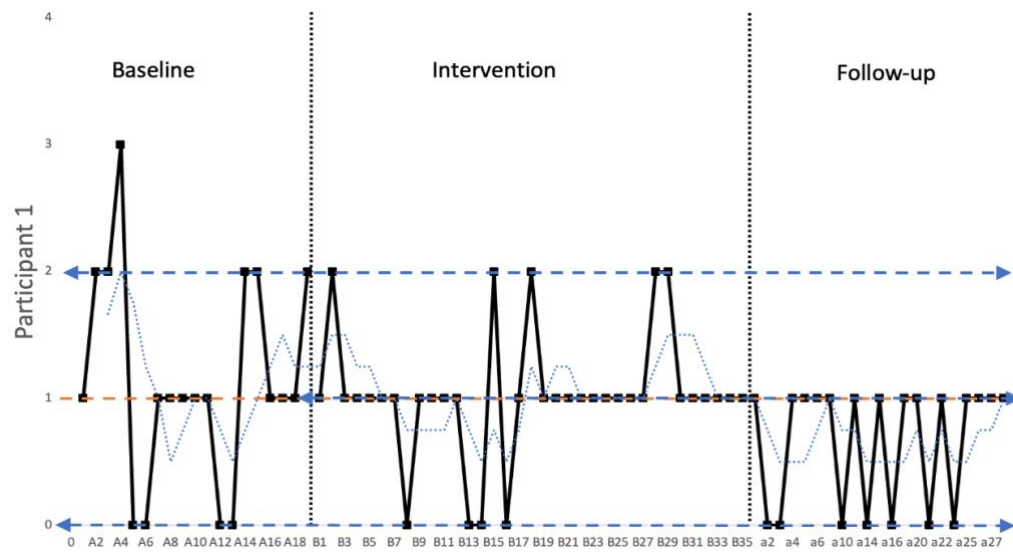
The visual and statistical analysis of the VAS variables will be reported, with any potentially confounding variables related to individual self-reported life events acknowledged. Tau-U data and an overview of statistical change found across participants is provided in Appendix P, Tables O1-O2.

### **Low Mood**

Half of the participants demonstrated significant improvements at follow-up compared to baseline (N=3). For P3, a reduction in central tendency was observed between baseline and intervention, accompanied with a significant negative Tau-U score ( $-0.55, p < 0.01$ ), indicating that the intervention may have contributed to improvements in P3's mood. This change was maintained at follow-up (Tau-U =  $-0.52, p < 0.01$ ). For P4, whilst fluctuations in low mood were observed, a downward trend suggestive of an improvement in low mood was evident over the course of the phases. A significant amount of data non-overlap between baseline and intervention and follow-up combined (Tau-U =  $-0.43, p < 0.01$ ) confirmed that over time P4 experienced less low mood compared to baseline. Visual analysis in relation to the follow-up period for P5 is limited due to the data collected only reflecting the first two weeks of the follow-up period. For P5, a significant reduction between baseline and intervention was found suggesting that the intervention led to improvements in mood for P5 (Tau-U =  $-0.71, p < 0.01$ ). This reduction remained significant at follow-up (Tau-U =  $-0.66, p < 0.01$ ). P1, P2 and P6 did not demonstrate any significant change in self-reported mood.

Figure 5: Low mood VAS



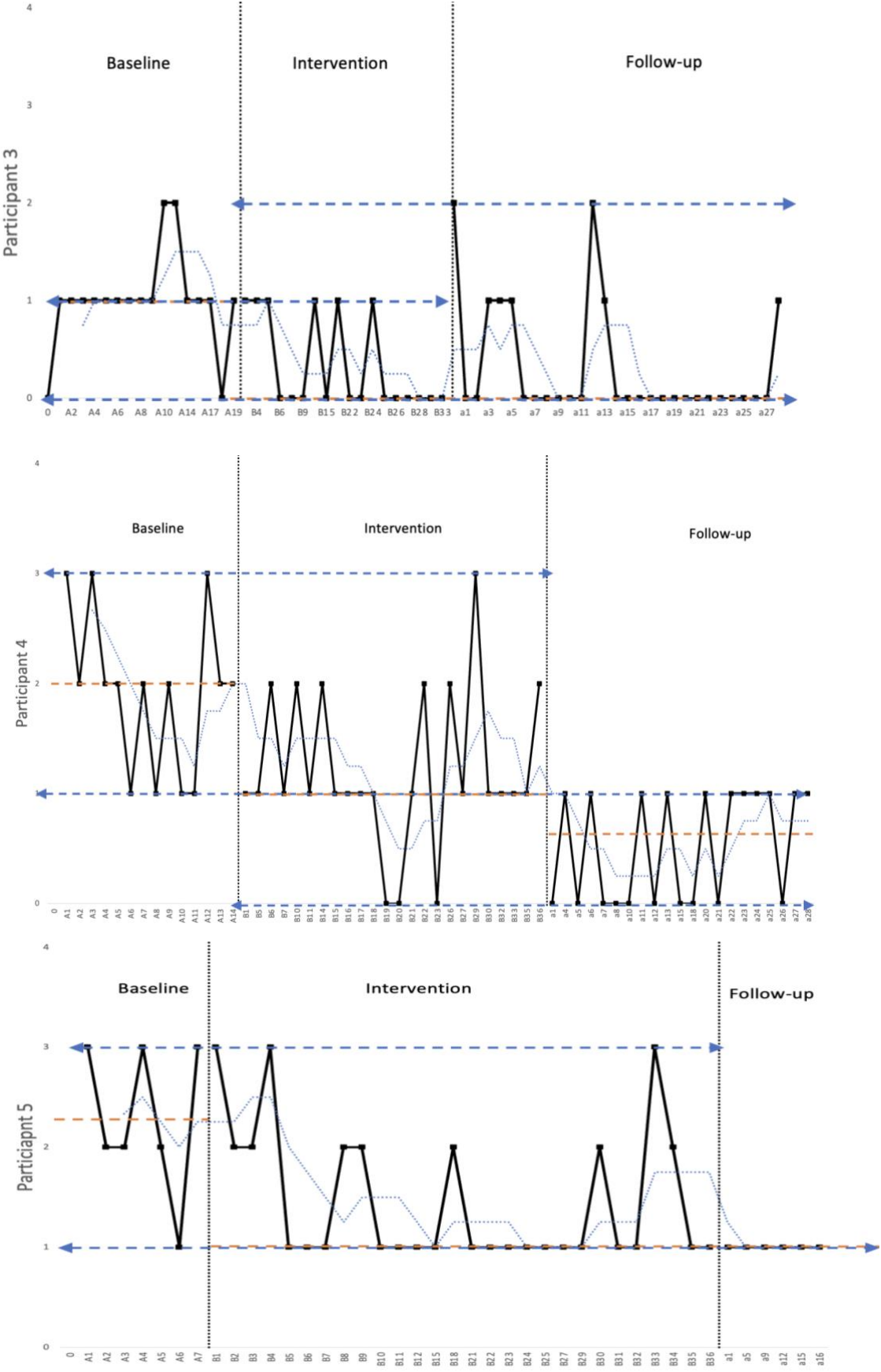


*Note.* Each datapoint on the y axis represents a self-rating on a 0-4 scale (0=not at all, 4=very much so) of how upset and or downhearted participants felt over the last 24-hour period. Each datapoint on the x axis denotes when the measure was completed.

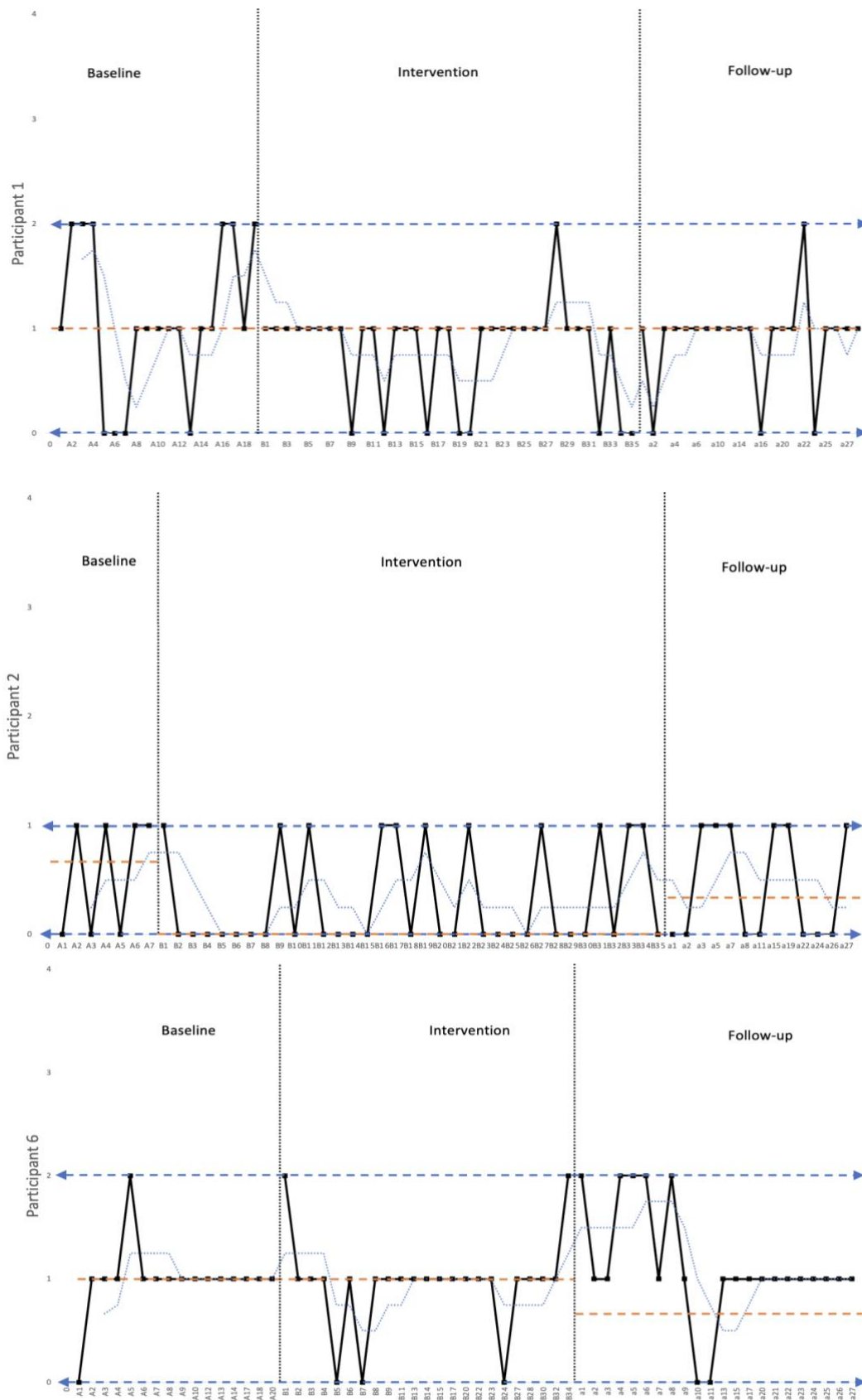
## Anxiety

Half of the participants ( $n=3$ ) had a significant reduction in anxiety levels during the intervention that was maintained at follow-up. For P3, a significant downward trend and drop in central tendency was shown between baseline and intervention ( $\text{Tau-U}=-0.57, p<.001$ ). This reduction remained significant at follow-up ( $\text{Tau-U}=-0.66, p<.001$ ), suggesting that the intervention may have supported P3 in reducing their levels of anxiety. A downward trend and reduction in central tendency was also observed for P4 accompanied by significant negative Tau-U scores between baseline and intervention ( $\text{Tau-U}=-0.49, p=0.01$ ), intervention and follow-up ( $\text{Tau-U} = -0.50, p<0.01$ ) and between baseline and intervention and follow-up combined ( $\text{Tau-U} = -0.50, p<0.001$ ), suggesting that the intervention may have led to a reduction in self-reported anxiety for P4. Similarly, for P5, a reduction in central tendency and downward trend from baseline to intervention was supported by a significant baseline to intervention comparison ( $\text{Tau-U}=-0.56, p=.02$ ) and baseline compared with intervention and follow-up combined ( $\text{Tau-U}=-0.61, p=0.01$ ). No significant findings were found for P1, P2 or P6. Of note, both P1 and P2 reported ongoing stressors pertaining to events which were unrelated to their physical health.

Figure 6: Anxiety VAS





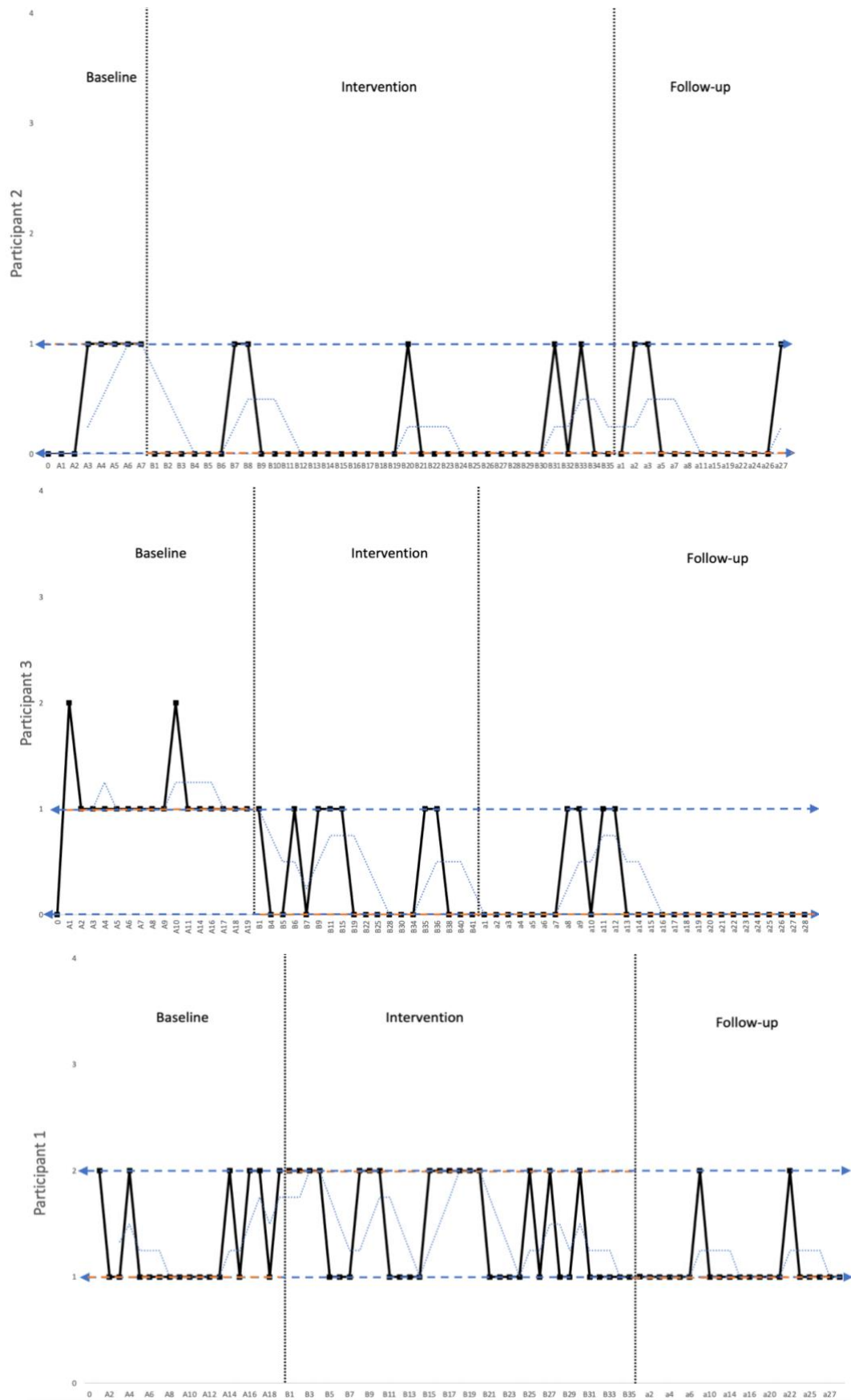


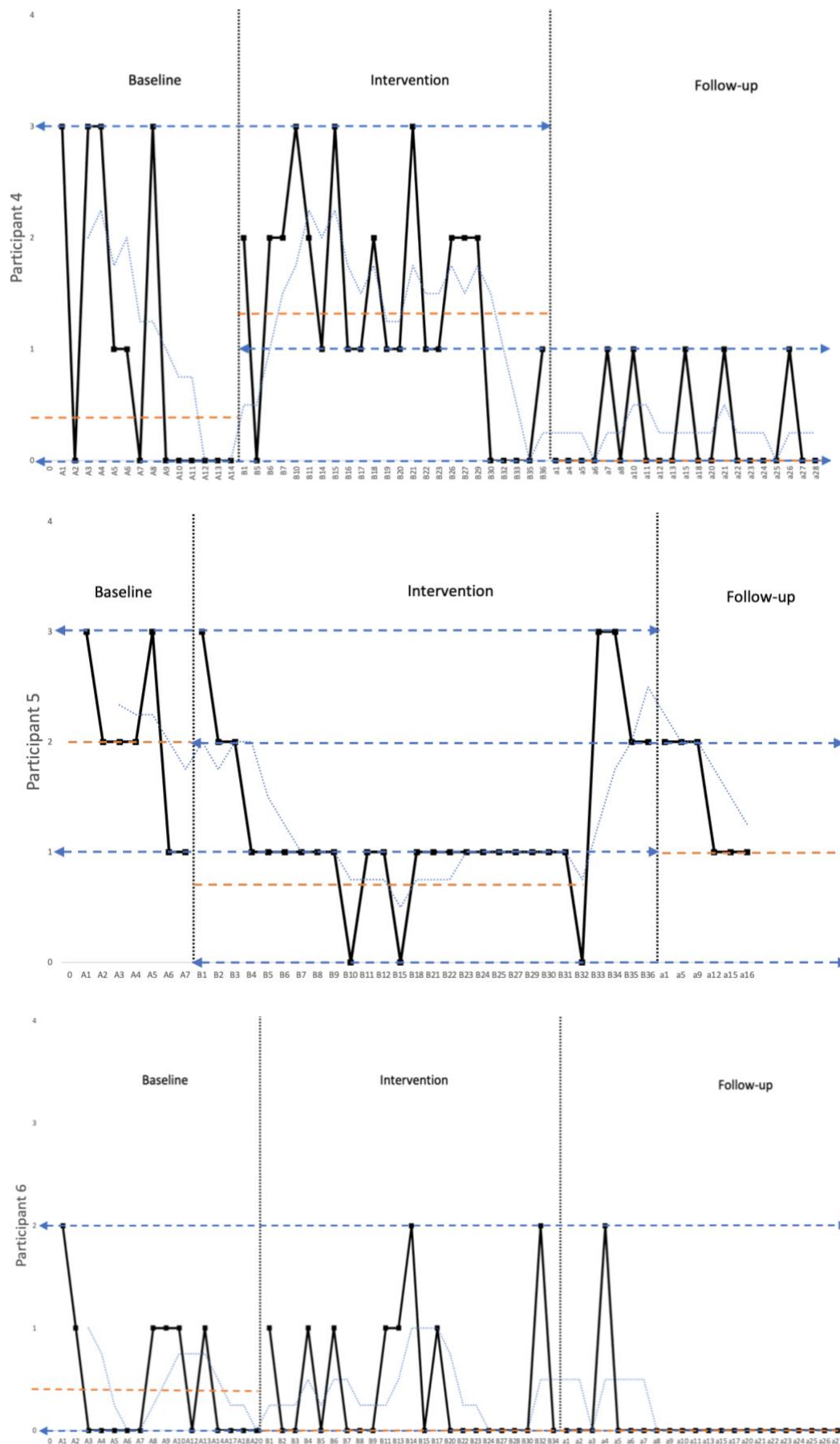
*Note.* Each datapoint on the y axis represents a self-rating on a 0-4 scale (0=not at all, 4=very much so) of how anxious participants felt over the last 24-hour period. Each datapoint on the x axis denotes when the measure was completed.

## Pain

Visual analysis of how “bothered” participants were by their pain (Figure 7) suggested that all participants experienced fluctuations in their ratings across phases. For P2, a downward trend suggestive of being less “bothered” by pain was observed between baseline and intervention ( $\text{Tau-U}=-0.69, p=.02$ ) and this remained significant at follow-up ( $\text{Tau-U}=-0.55, p=.02$ ). For P3, a downward trend pertaining to being less “bothered” by pain was observed from the second half of the intervention phase and remained at follow-up. A significant amount of data non-overlap between baseline and intervention ( $\text{Tau-U}=-0.68, p<0.001$ ) and follow-up combined ( $\text{Tau-U}=0.80, p<0.001$ ) confirmed that over time P3 experienced less bothersome pain compared to baseline. P1 reported being significantly less “bothered” by pain from intervention to follow-up only ( $\text{Tau-U}=-0.36, p=.02$ ), indicating that the intervention could have possibly impacted upon P1’s experience of pain post-intervention. For P4, significant baseline trend was found ( $p=.02$ ), suggestive of being significantly less “bothered” by pain. P4’s central tendency was observed to increase during the intervention phase and fall below baseline levels within the follow-up stage, these changes coincided with medication changes. Tau-U analysis, comparing intervention to follow-up, controlling for trend, found a significant negative Tau-U score ( $\text{Tau-U}=-0.66, p<0.001$ ), suggesting that the intervention may have led to improvements in how “bothered” P4 was by pain. This change was not significant when comparing across phases. For P5, a downward trend in how “bothered” they were by pain was observed between baseline and intervention accompanied by a significant negative Tau-U ( $\text{Tau-U}=-.49, p=.04$ ). This change was not maintained at follow-up, with a slight increase being observed. No significant changes were found for P6.

Figure 7: Pain VAS



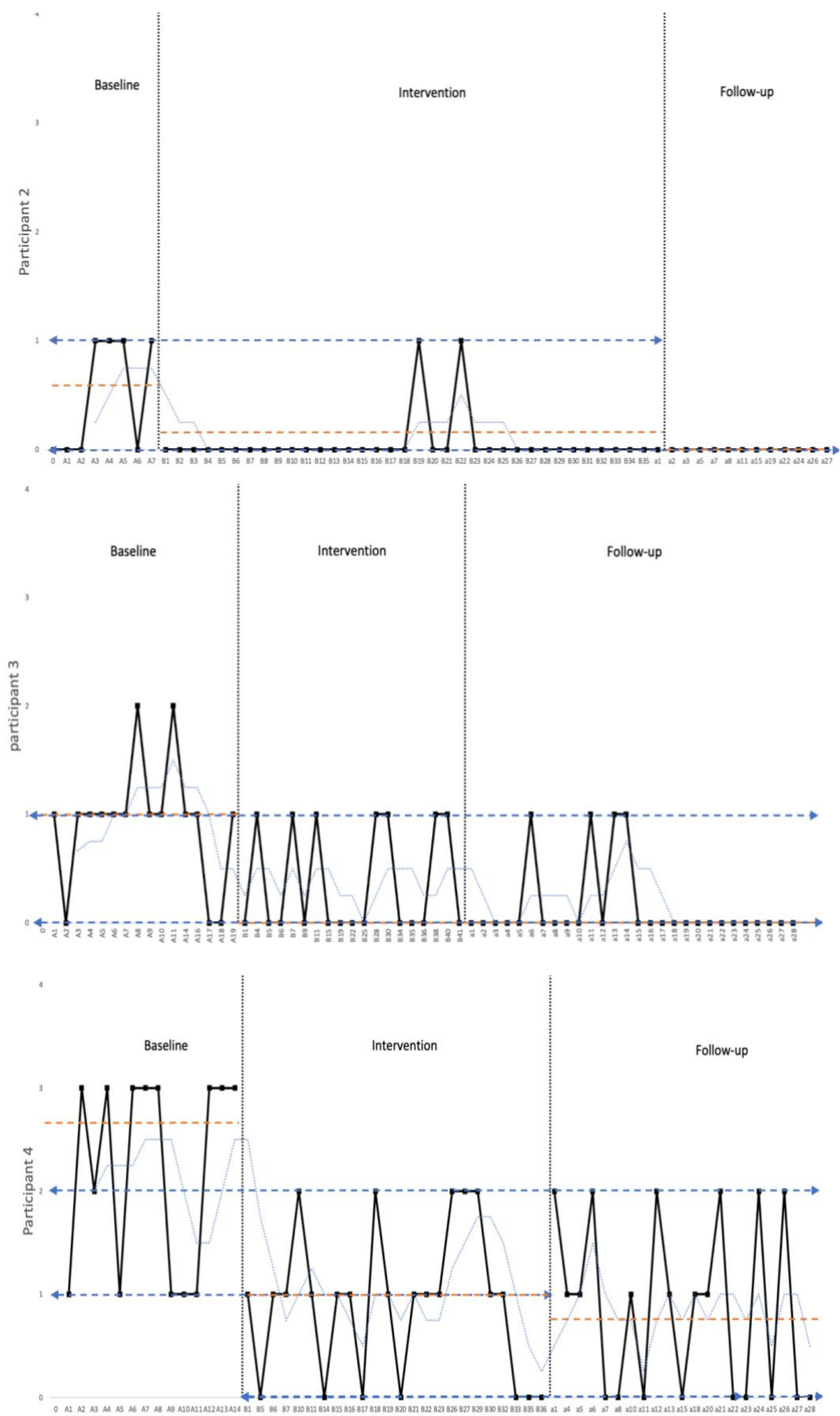


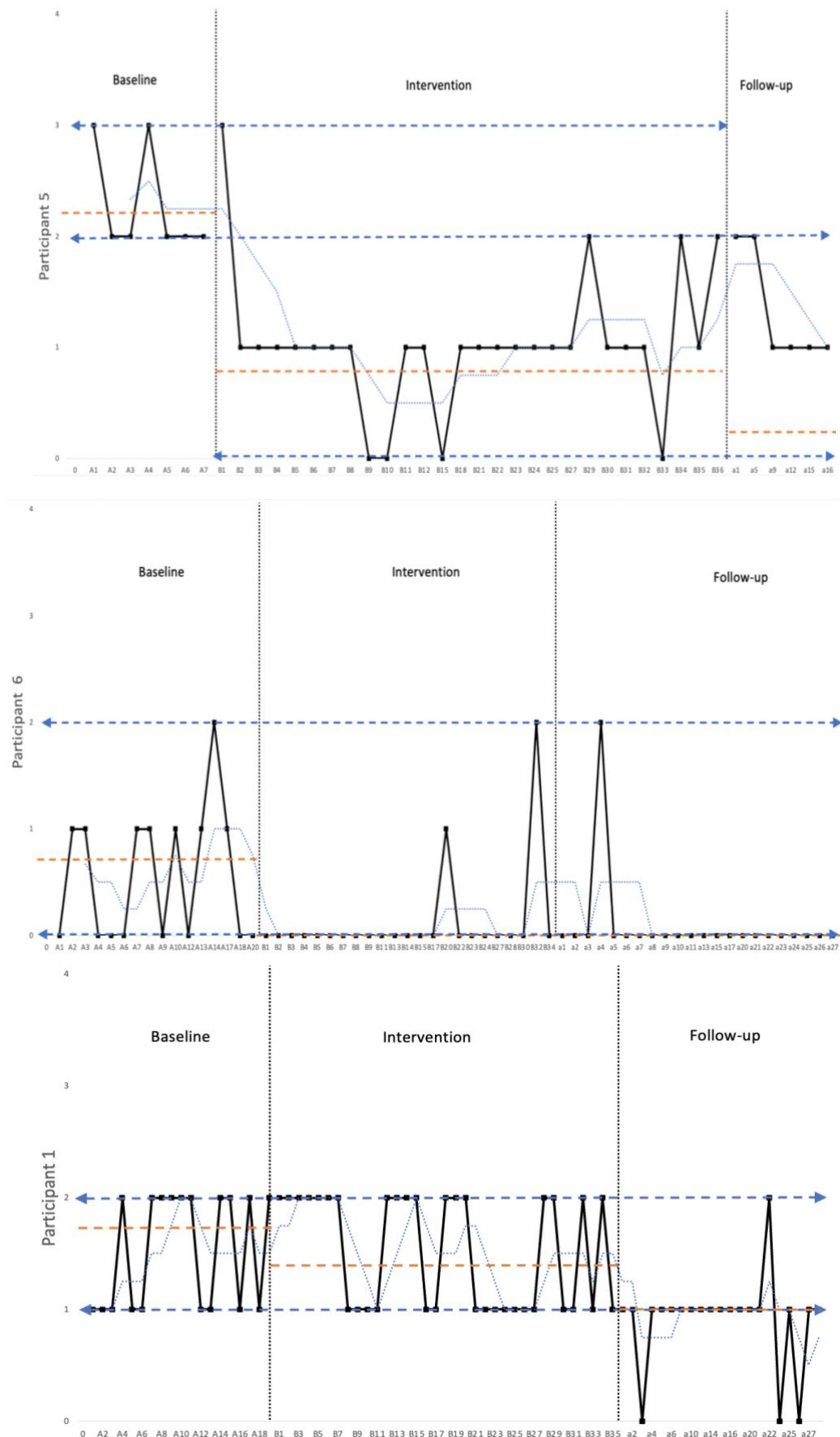
*Note.* Each datapoint on the y axis represents a self-rating on a 0-4 scale (0=not at all, 4=very much so) of bothersome pain over the last 24-hour period. Each datapoint on the x axis denotes when the measure was completed.

## Fatigue

All six participants demonstrated some significant improvement pertaining to how “bothered” they felt by fatigue post-intervention. Five participants demonstrated the maintenance of gains at follow-up. For P2, a significant reduction in fatigue “bother” ratings was observed between baseline and intervention ( $\text{Tau-U} = -.51, p = .03$ ), and baseline and other phases combined ( $\text{Tau-U} = -.053, p = .02$ ) suggesting that the intervention may have changed the way in which P2 experienced fatigue and that this was maintained at follow-up. For P3, observed improvements were confirmed by significant Tau-U analyses between baseline and intervention ( $\text{Tau-U} = -0.60, p = .01$ ) and baseline and other phases combined ( $\text{Tau-U} = -0.72, p < .001$ ), suggesting that post intervention improvements in how P3 experienced fatigue remained at follow-up. A steady reduction in central tendency and downward trend in the data was additionally shown for P4. Tau-U analysis revealed significant reduction in fatigue bother ratings between baseline and intervention ( $\text{Tau-U} = -0.66, p < 0.001$ ) and between combined phases ( $\text{Tau-U} = -0.67, p < 0.001$ ). Similarly, a downward trend in fatigue bother ratings for P5 was supplemented by a significant negative Tau-U score between baseline and intervention ( $\text{Tau-U} = -0.86, p < .001$ ) and baseline to follow-up ( $\text{Tau-U} = -.85, p < .001$ ). For P6, a significant improvement in the fatigue bother ratings was found between baseline and intervention ( $\text{Tau-U} = -.40, p = .04$ ) and between combined phases ( $\text{Tau-U} = -.40, p = .01$ ) suggesting gains were maintained at follow-up. For P1, a significant reduction in central tendency was found between intervention and follow-up only ( $\text{Tau-U} = -0.54, p < 0.001$ ), suggesting the intervention may have had a significant impact on how bothered by fatigue P1 was but that this was not maintained at follow-up.

Figure 8: Fatigue VAS





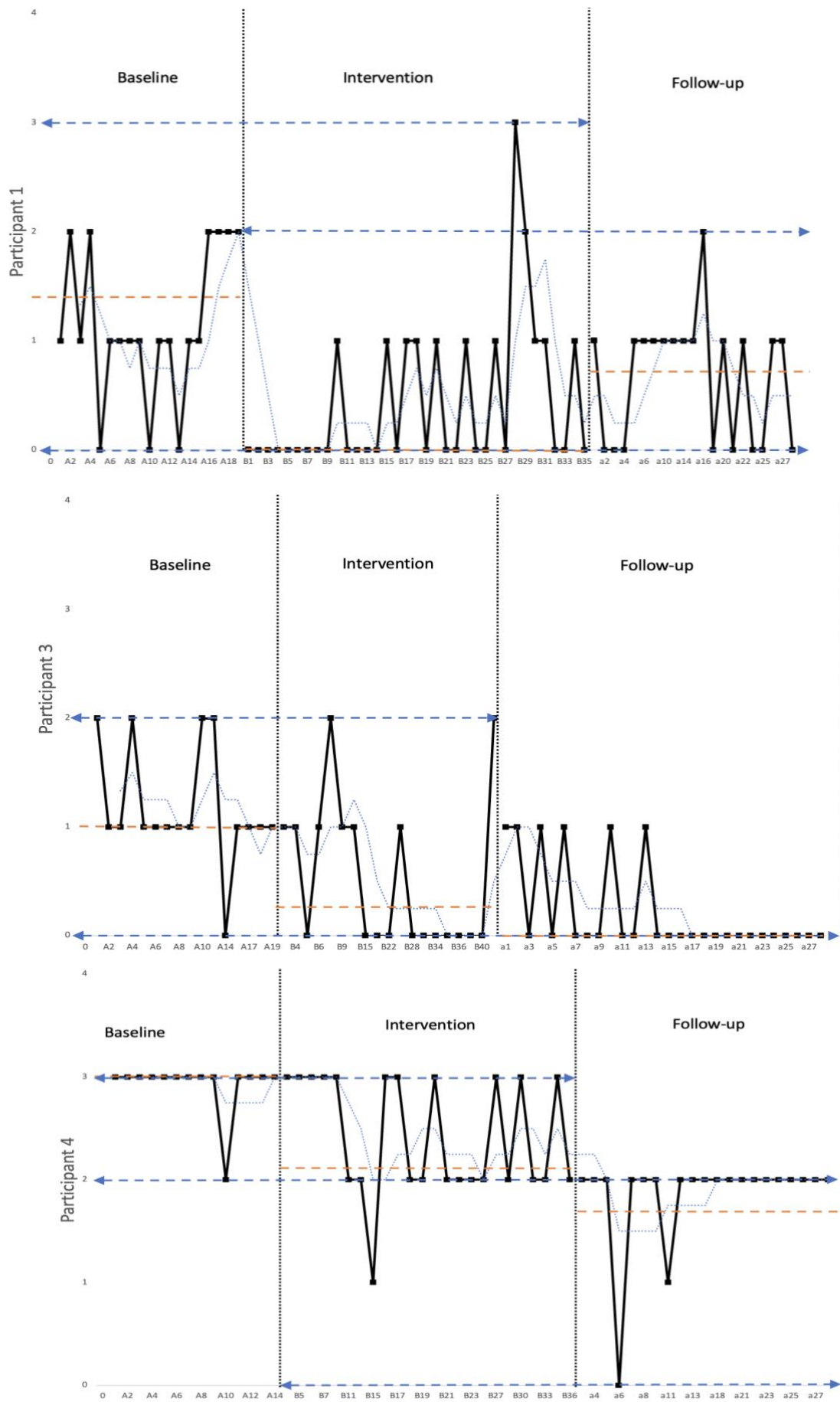
*Note.* Each datapoint on the y axis represents a self-rating on a 0-4 scale (0=not at all, 4=Very much so) of how bothered participants had been by fatigue related to cancer over the last 24-hour period. Each datapoint on the x axis denotes when the measure was completed.

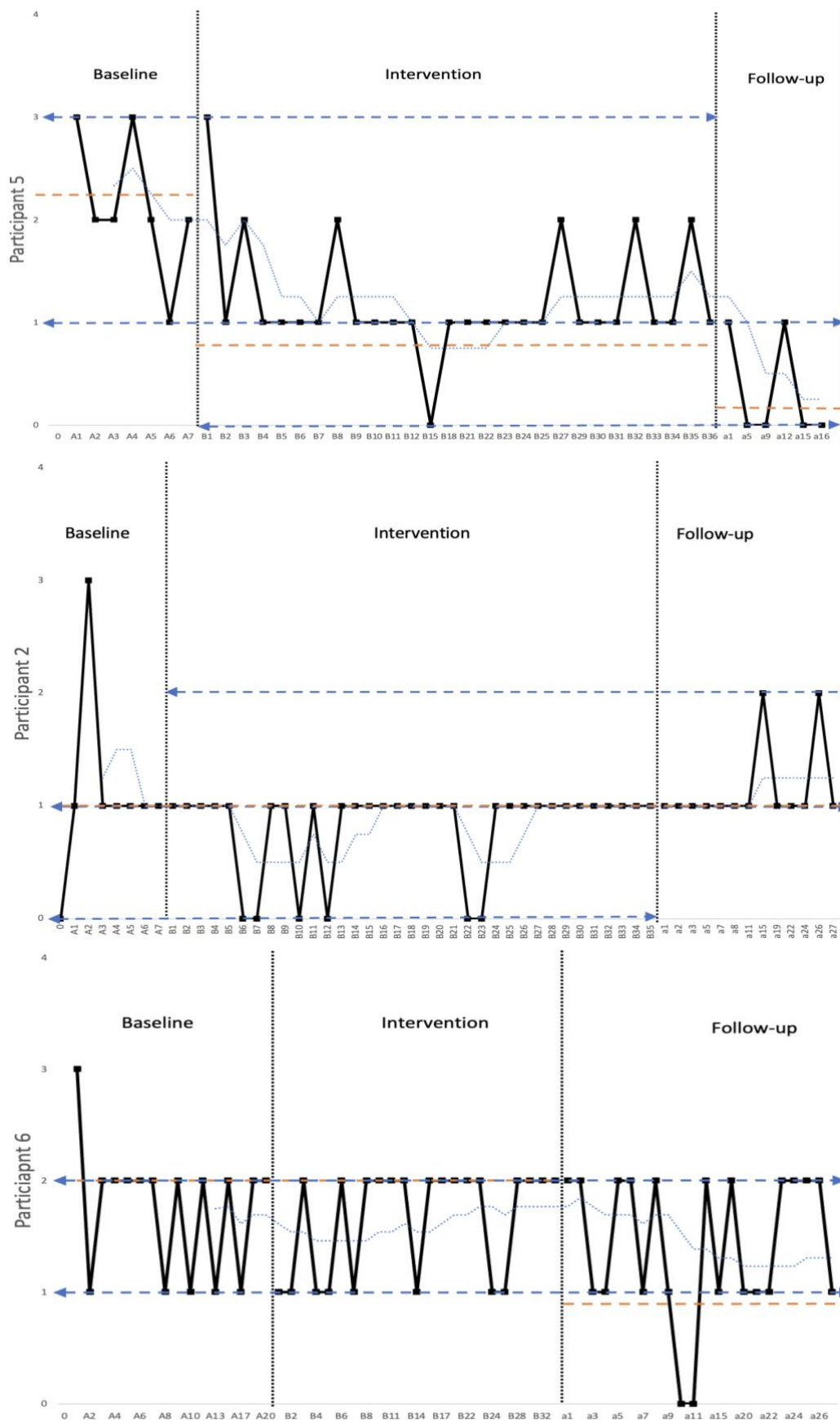
## Mindfulness

Four participants demonstrated significant improvements in their capacity to attend to the present moment and engage in activities that mattered to them as indicated by a reduction in self-rated scores. These improvements were additionally maintained at follow-up. For P1, a visual reduction in central tendency was observed for between baseline and intervention, this was accompanied by a significant negative Tau-U ( $-0.55, p < 0.001$ ) suggesting that the intervention led to improvements in mindfulness for P1. Between intervention and follow-up, a slight increase in the central tendency was observed, however when comparing across phases a significant improvement in mindfulness was found (Tau-U=-0.49,  $p < .001$ ). For P3, a downward trend and reduction in central tendency was observed between baseline and intervention (Tau-U=-0.52,  $p < 0.01$ ) and baseline and the other phases combined (Tau-U=-0.67,  $p < .001$ ), suggesting that the intervention may have led to improvements in mindfulness which were maintained at follow-up. A downward trend in the data was similarly observable for P4, with significant negative Tau-U scores between baseline and intervention (Tau-U=-0.47,  $p < 0.05$ ) intervention and follow-up (Tau-U=-0.47,  $p < 0.01$ ) and combined across phases (Tau-U=-0.69,  $p < .001$ ). An increase in P5's self-reported mindfulness was observed between baseline and intervention, this was complimented by a significant negative Tau-U score (Tau-U=-0.68,  $p < 0.001$ ), between intervention and follow-up (Tau-U=-0.70,  $p < 0.05$ ) and across phases (Tau-U=-0.73,  $p < 0.01$ ), suggestive of post intervention gains which were preserved at follow-up. No significant findings were noted for P2 or P6. P2's mindfulness ratings fluctuated over the course of the study; these fluctuations coincided with self-reported worries pertaining to the ongoing war in Ukraine



Figure 9: Mindfulness VAS





*Note.* Each datapoint on the y axis represents a self-rating on a 0-4 scale (0=not at all, 4=Very much so) of the extent to which participants spent time thinking about the past or future rather than being engaged in the activities that mattered to them over the last 24-hour period. Each datapoint on the x axis denotes when the measure was completed.

## **Omnibus Tau-U Effect Sizes.**

Across all participants, comparing intervention and follow-up data relative to baseline data found significant improvements to be maintained for low mood (Tau-U=-0.32,  $p<.001$ ), pain (Tau-U=-0.29,  $p<.001$ ), fatigue (Tau-u=-0.52,  $p<.0001$ ) and mindfulness (Tau-U=-0.49  $p<.001$ ). Significant weighted averages do not however permit the inference of causal conclusions (Parker & Vannest, 2012). Several potentially confounding variables such as medication changes; missing participant follow-up VAS data and significant life events impact upon the extent to which inferences regarding causation are possible.

## **Standardised Measures**

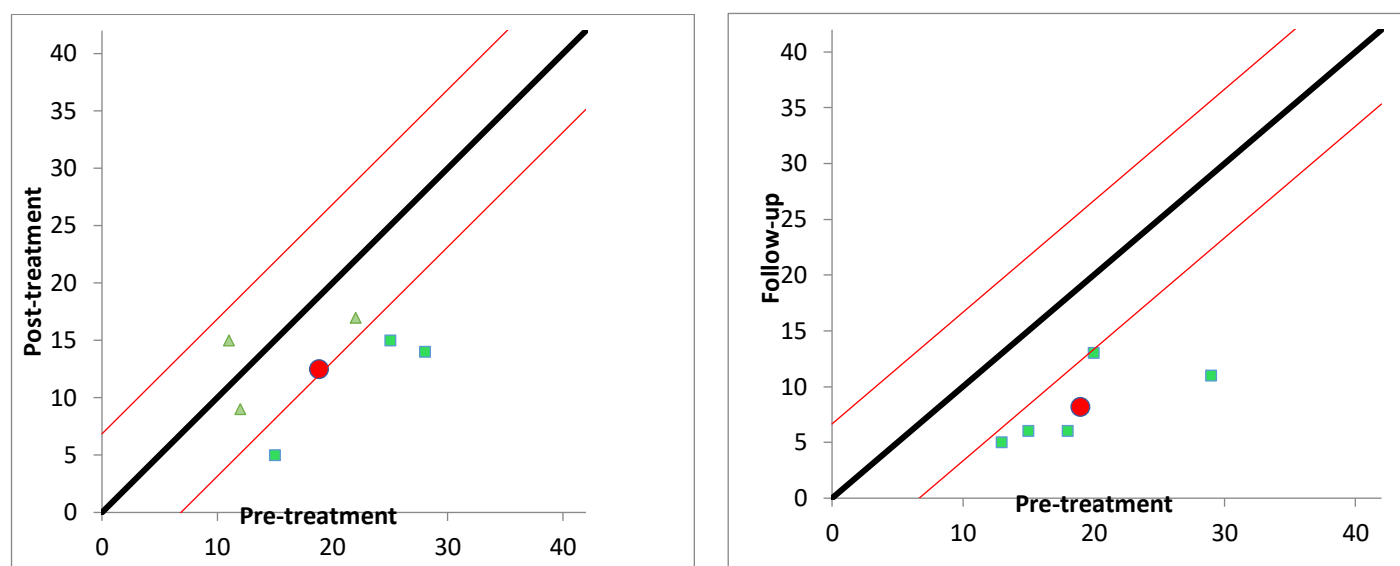
Standardised questionnaires were utilised to ascertain whether any participants reached reliable change (RC) and clinically significant change (CSC) on a measure of cancer specific QoL (CancerDQOL) and on a measure of anxiety and depression (HADS). An increase in QoL scores and a decrease in HADS scores from pre-intervention to follow-up was hypothesised. To calculate and chart the RC and CSC data for each of the standardised measures, the Leeds Reliable Change Indicator (Morley & Dowzer, 2014) was utilised. Figure 10 presents the outcome measures ascertained pre-intervention, post intervention and at follow-up. Pre-intervention score for the HADS was the average of baseline and beginning of intervention scores. The raw scores for each of the time points and RCI values are presented in Appendix Q, Table Q1-Q3

## **Anxiety and Depression (HADS)**

Post intervention, three participants (P3, RCI=3.29.,  $p<.05$ ; P4, RCI=4.94,  $p<.05$ ; P5, RCI= 4.61,  $p<.05$ ) demonstrated reliable improvement and CSC using criterion b, which considers CSC to occur when post-intervention scores shift within 2 SD of the non-clinical population distribution. Comparing pre-intervention and follow-up scores, all five participants who completed the HADS demonstrated reliable improvement and CSC in combined anxiety and depression (P1, RCI=2.30,  $p<.05$ ; P2, RCI = 2.63,  $p<.05$ ; P3, RCI =2.96,  $p<.05$ ; P4, RCI =5.93,  $p<.05$  and P6, RCI = 3.95,  $p<.05$ ). Post hoc analysis of the anxiety subscale across pre-post intervention revealed reliable and clinically significant change for two participants (P4, RCI = 3.47,  $p<.05$ ; P5, RCI = 2.32,  $p<.05$ ). Reliable change and CSC in anxiety scores was found for two participants between pre-intervention to follow-up (P4, RCI = 5.47,  $p<.05$ ; P6, RCI = 3.78,  $p<.05$ ). Four participants were

shown to demonstrate reliable and CSC on the depression subscale of the HADS pre-post intervention (P2, RCI = 2.00; P3, RCI = 3.00 P4, RCI = 3.50; P5, RCI = 4.00), with this increasing to five participants demonstrating reliable and CSC at follow-up (P1, RCI = 2.69, P2, RCI = 4.48, P3, RCI = 5.37, P4 = 5.37, P6 = 6.27)

**Figure 10: Anxiety and Depression overall scores (HADS)**



#### *Reliable and Clinically Significant Change for HADS overall scores*

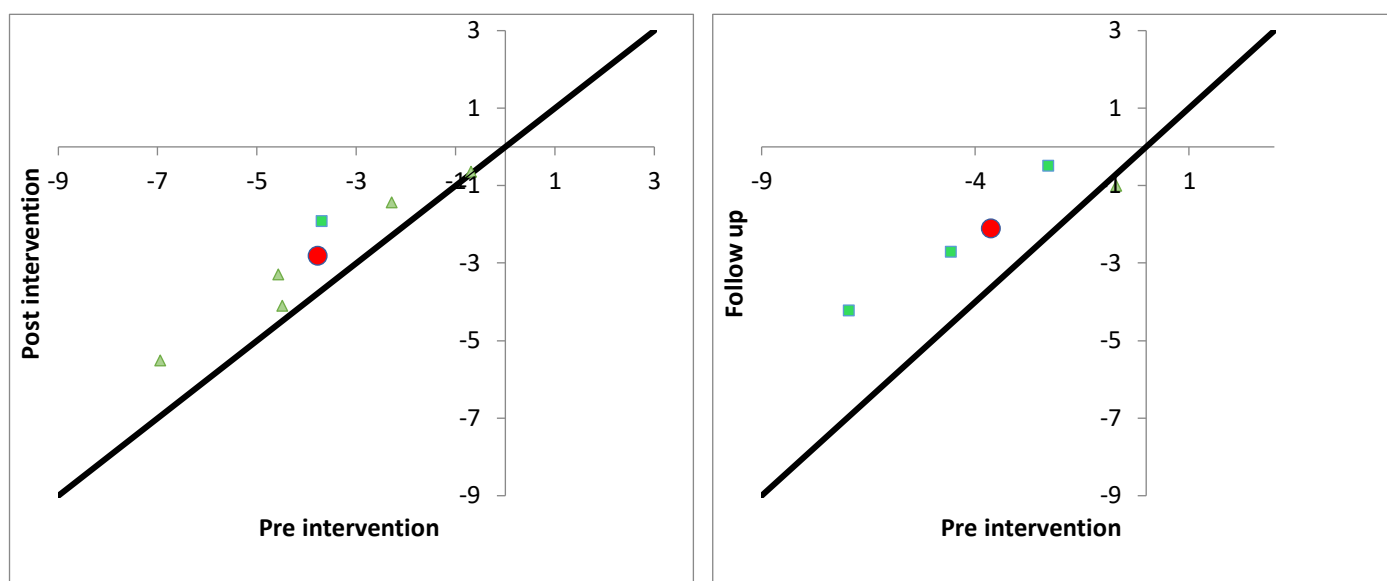
*Note.* Each datapoint on the y axis represents the range of possible HADS scores post-intervention or at follow-up. Each datapoint on the X axis represents the range of HADS scores pre intervention. Criterion B was used for CSC for all measures. ■ =reliable change; ▲ =no change; ◆ =deterioration; —=line of no change; ● = average clients score pre and post-intervention.

#### **Quality of life (Cancer DQoL)**

One participant reached RC and CSC on a cancer-specific measure of QoL when comparing pre to post intervention (P3; RCI=2.43,  $p<.05$ ). When comparing pre intervention to follow-up scores across the four participants who completed CancerDQoL follow-up measures, P1 (RCI = 2.29,  $p<.05$ ), P4 (RCI = 3.35,  $p<.05$ ) and P6 (RCI = 2.21,  $p<.05$ ) reliably improved.

**Figure 11: Cancer dependent Quality of Life scores**

*Reliable and Clinically Significant Change for CancerDQoL overall scores*



*Note.* Each datapoint on the y axis represents the range of possible CancerDQoL scores post-intervention or at follow up. Each datapoint on the X axis represents the range of CancerDQoL scores at baseline. Criterion B was used for CSC for all measures. ■ =reliable change; ▲ =no change; ● =deterioration; —=line of no change; ● = average clients score pre and post-intervention.

## Process Results

RC analysis was conducted in relation to the MPFI subscales of Global Flexibility and Global Inflexibility subscales, using the MDC95 index provided by Rolffs et al. (2018). As per the study hypotheses, an increase in Global Flexibility score between T2-T3 and between T2-T4 was expected to occur whilst a decrease in Global inflexibility scores was predicted. Raw scores and MDC index scores are presented in Appendix R, Tables R1-R2.

In terms of Global Flexibility, when comparing pre-post intervention, P1, P3, P5 and P6 reached reliable change with an increase in average scores found between the two time points larger than the MCD95 value of 1.10. P2 and P4 did not reach RC immediately post-intervention. When comparing pre intervention to follow-up, P1 and P6 maintained reliable change. Additionally, P4 demonstrated a reliable increase in flexibility scores when comparing follow-up to pre intervention. No reliable change was observed for P3 at follow-up. P5 did not complete the follow-up measures.

Reliable change in relation to Global inflexibility was shown for P3 and P6 who both demonstrated a decrease in scores larger than the MCD95 value of 0.84 when comparing pre- to post-intervention scores. P4 additionally approached RC (.84) and went on to demonstrate reliable change at follow-up. P3 and P6 continued to evidence reliable change in inflexibility at follow-up.

## **Discussion**

This study utilised a multiple baseline SCED design and sought to develop and test the feasibility, acceptability, and preliminary effectiveness of a web-based ACT intervention for people living with cancer. The main findings of the study will be discussed in relation to the existing literature and the study's strengths and limitations. Additionally, recommendations for future research will be presented.

### **Main Findings**

#### ***Feasibility and Acceptability***

Whilst studies specifically exploring the feasibility of ACT within oncology are relatively scarce, promising outcomes have been found within the context of LTCs (Graham et al., 2016). Further, web-based interventions are thought to hold promise for people living with cancer and have been shown to be generally well received (Roy et al., 2020). The hypothesis that this online intervention would be deemed acceptable by participants was supported through the feedback (qualitative comments and questionnaire scores) received, with most participants reflecting positively on the intervention. Feasibility was additionally supported by the intervention completion rate: Of those participants who began the intervention, 80% completed all modules. This rate is alike to other studies that have looked at online interventions within oncology (Wootten et al., 2014) and favourable when compared to online psychological interventions within the general population (Lintvedt et al., 2011). Furthermore, there were surprisingly fewer participants eligible for referral into the study than anticipated due to Maggie's, Royal Marsden seeing fewer non-palliative visitors to centre. Subsequently, the 25% attrition rate found in this study equates to only two participants dropping out after having initially started the intervention. When considering feasibility, it is important to note that a small sample size was utilised whereby most participants were selected and referred to the study through Maggie's. Furthermore, that 50% of the

population sample were retired with more time to commit to completing the study. Therefore, whilst the intervention was found to be feasible within this sample, further research exploring the feasibility within a larger sample of adults living with cancer would be advantageous.

## **Psychological Outcomes**

Results suggested that the intervention had beneficial effects on low mood and anxiety for most participants. Overall scores on the HADS were observed to reliably decrease for all participants at follow-up. Scores on the HADS depression subscale were observed to reliably decrease for four participants between baseline and intervention and for five participants when comparing baseline to follow-up, providing encouraging, albeit preliminary, support for the effectiveness of the online ACT intervention for people living with cancer. These findings are consistent with previous research which found significant reductions in depression amongst women with ovarian cancer following the delivery of face-to-face ACT (Rost et al., 2012). This outcome is particularly promising given that depression is recognised to be especially difficult to assess and successfully treat within the oncology population (Greenberg, 2004). It is noteworthy, that whilst the low mood VAS measure was suggestive of significant reductions at follow-up for three participants, two participants were shown to demonstrate improvement on the HADS depression subscale but not the VAS measure of low mood. This discrepancy between the measures is perhaps unsurprising given the differing focus of the items. Whilst the HADS focuses primarily on the anhedonic symptoms of depression over the last fourteen days (Edelstein et al., 2010), the VAS item presented to participants encouraged global reflection of low mood over the past 24 hours. VAS measures have been shown to be acceptable and valid for use within the general population (Huang et al., 2020) and to correlate positively with the HADS depression subscale within a sample of women with ovarian cancer (Widyastuty et al., 2019). However, one review which looked at patient-reported outcome measures within oncology found VAS measures to be inferior when compared to measures such as the HADS (Wakefield et al., 2015). One explanation may be that when feeling low in mood, attentional biases can result in a tendency to focus on negative stimuli (Mennen et al., 2019) and as such, when asked to globally reflect on emotional states there may be a tendency to overestimate the prevalence of low mood (Thombs et al., 2018). Future

research incorporating a clinician-led interview alongside self-report measures may therefore be beneficial. None the less, the findings from this study are in accordance with the findings of other studies which found ACT to be an effective approach leading to reductions in low mood (Feros et al., 2013; Rost et al., 2012).

Findings for the anxiety subscale of the HADS provide some support of the study hypotheses, with a reduction in anxiety found for two participants post-intervention and at follow-up. Three participants demonstrated a significant reduction at follow-up on the VAS ratings of anxiety. One participant did not complete the HADS at follow-up, however they did demonstrate a significant reduction in HADS anxiety post-intervention and on the VAS anxiety measure post-intervention and at follow-up. These findings are encouraging and in accordance with research showing ACT within a group-based setting led to significant reductions in anxiety scores post-intervention for women with breast cancer (Mohabbat-Bahar et al., 2015) and opposes the findings of Arch et al. (2021), where group-based ACT sessions did not lead to significant reductions in anxiety post-intervention. The present study provides preliminary support for the use of online ACT interventions within oncology to support the reduction of anxiety and depression.

QoL within cancer is often assessed via measures which blend physical health status and functioning with QoL (Bradley, 2001). This study utilised a new individualised cancer-specific QoL measure (CancerDQoL; Garden et al., 2021) and found the initial hypothesis to be partially supported. One participant demonstrated reliable improvement in QoL post-intervention and three people had reliable improvement in QoL at follow-up. This finding supports previous research which has demonstrated the potential benefits of ACT interventions in relation to QoL improvements (Fashler et al., 2018; Li et al., 2021). Further, this finding is particularly promising given that it was found despite a small population size and over a relatively short period of time, with previous research suggesting that longer ACT-based interventions equate to greater effect (Mani et al., 2019). Future studies looking at treatment dosage exploring the number of ACT sessions required to evoke change may therefore be of interest. Further, given that the CancerDQoL recognises the individualised nature of QoL by considering the weighted impact (by importance) of cancer on domains of life, further research exploring post-intervention changes across individual QoL domains could be an interesting avenue of future research and may aid understanding of



the ways in which the intervention impacts upon the areas of life which patients report as being most impacted and important to their cancer-related QoL.

Support was obtained for the impact of the intervention on how bothered participants felt by their pain and fatigue: Three participants showed a significant reduction in how bothered they were by their pain post-intervention, with this reduction remaining significant when comparing pre-intervention to follow-up for two participants. This finding is in accordance with a previous group-based ACT study which looked at the experience of pain post-intervention (Mani et al., 2019), however the finding is in contract to an ACT-based study which looked at physical distress amongst people living with lung cancer where no substantial reduction in symptom interference and related distress was found (Mosher et al., 2019). Whilst ACT does not enable the direct reduction of pain, it does seek to reduce the impact of symptoms through supporting patients to abandon the ongoing struggle with symptoms and adopt greater acceptance of thoughts and feelings associated with cancer (Ghorbani et al., 2021). It could be argued that the changes in how bothered participants were by pain may have been reflective of physiological changes, possibly occurring due to medication changes, rather than greater psychological flexibility. However, any changes in medication were monitored throughout the study, with only one participant reporting pharmacological alterations which conversely heightened the physical experience of pain.

For fatigue, findings post-intervention were particularly strong with five out of the six participants being observed to be significantly less bothered by their symptoms post-intervention with these improvements in fatigue maintained at follow-up. These findings are in accordance with previous research where a reduction in fatigue was found post a group-based ACT intervention (Mosher et al., 2018). The finding that improvements in how bothered participants were by fatigue and pain predominantly remained at follow-up is particularly promising given the findings of Mosher et al. (2018) who found that fatigue bother ratings did not differ between an ACT group and an education-based support group 12 weeks post-intervention. However, the current study utilised a relatively short follow-up period of four weeks and thus longer-term follow-up would be beneficial.

## Process Outcomes

Consistent with the ACT model, the intervention was associated with an increase in mindfulness skills; post-intervention four participants had statistically significant improvements in mindfulness, with changes continuing to be maintained at follow-up. Mindfulness is a key component of ACT and is proposed to be a potential mechanism through which perceived symptom reduction and interference may occur (Hayes et al., 2006). To our knowledge however, no studies have specifically looked at whether mindfulness increases post-intervention within the oncology population. Whilst this study has not explored whether the change in mindfulness preceded the changes observed in fatigue and pain bother ratings, the finding that these changes occurred in unison is encouraging, particularly given the novel online aspect to this study.

In terms of psychological flexibility (PF), reliable change occurred for most participants post-intervention ( $n=4$ ), with three participants found to have reliably increased compared to baseline levels at follow-up. Whilst the sample size is small, this finding provides preliminary evidence for the impact of online ACT on PF and is in accordance with a recent review which found PF to increase post ACT intervention amongst people living with cancer (Zhao et al., 2021). This finding contributes to a recognised need within the literature to improve understanding of the impact ACT may have on psychological flexibility for people living with cancer. In a review of the literature, Zhao et al. (2021) found that there is not enough evidence to confidently draw conclusions about the effects of ACT on psychological flexibility within this population. It is also worth noting that studies which looked at psychological flexibility within oncology have tended to do so using The Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011) (e.g. Feros et al., 2013; Najvani Et al., 2015), which is often criticised in terms of its construct and discriminant validity (Gámez et al., 2011; Wolgas, 2014). The use of the Multidimensional Psychological Flexibility Inventory (MPFI) in this study is therefore a comparative strength. The MPFI has been found to have good construct and discriminant validity (Giulia et al., 2021). When comparing follow-up inflexibility scores with baseline scores, reliable change was found for most participants ( $n=3/5$ ).

P4 and P5 were noted to be the two participants with the greatest level of pre-intervention psychological distress using the HADS. Interestingly, reliable change was found to have occurred between pre and post-intervention for both participants, and between baseline and follow-up for P4, as P5 did not complete follow-up measures. This change in HADS scores was accompanied by a significant increase in flexibility scores, and a significant decrease in inflexibility scores for P4, which supports the previous finding in the literature that higher levels of psychological flexibility tend to be linked to lower levels of psychological distress (Fledderus et al., 2013). Further research exploring the role of psychological flexibility in relation to psychological outcomes over a longer timeframe may be of interest, particularly given the finding that the impact of psychological flexibility over time is thought to lessen in relation to depression as opposed to anxiety (Fledderus et al., 2013). For P5, a reliable change in inflexibility was not found however. This adds further weight to the notion of needing to consider the independent role of the two constructs despite a tendency within research to group both flexibility and inflexibility together (Howel & Demuynck, 2021).

### **Strengths and Limitations**

Using SCED methodology was a strength of this study. ACT-based studies are often criticised for the lack of methodological rigor (Graham et al., 2016), with RCTs typically considered within psychology to be the most methodologically robust means to establish cause and effect (West & Thoemmes, 2010). SCED methodology has however been shown to be a robust approach which, when held up against RCTS, can provide a scientifically rigorous alternative, especially for interventions that are in the preliminary development phase (Kratochwil et al., 2013). Further, SCED designs have been shown to be an appropriate means through which to evaluate novel digital interventions (Dallery et al., 2013), and through randomisation to baseline the design enable threats to internal validity to be accounted for, such as maturation (Lobo et al., 2018). This study was sufficiently powered, with Horner et al. (2005) finding that effect replications can be demonstrated with as few as three participants. A further strength is that in instances where three or more effect replications were observed, omnibus effect size calculations were permitted enabling across study comparisons (Hedges et al., 2012).

Owing to the online nature of the intervention, several possible confounding variables warrant acknowledgement. Firstly, the extent of participant home-practice outside of modules or the use of other mindfulness-based applications were not monitored. Consequently, extraneous variables such as home-practice and heterogeneity in adherence to the intervention may have restricted the internal validity of the current study (Donkin et al., 2011). Additionally, the wider global context within which participants were taking part in the study is important to acknowledge. Whilst personal life events such as ongoing disputes with family members were considered when reviewing the results of the study, other stressors such as the Covid-19 pandemic and war in Ukraine may have also contributed to overall levels of psychological distress experienced by participants and impacted upon the potential psychological gains from the intervention.

There were both strengths and limitations in relation to the participant sample. Male and female participants with a range of cancer diagnoses at different stages took part in the intervention. All participants were however from a predominantly white background, fluent in English, computer literate and were a minimum of nine months post diagnosis at the time of study participation. Therefore, extrapolation of the findings to a more diverse population is somewhat restricted. Given that the impact of cancer is recognised to vary across age groups and length of time since diagnosis (Husson et al., 2020), it would be of benefit for future research to look at the effectiveness of the intervention across a wider age range. Further, qualitatively it was reported that participants felt this intervention may have been particularly helpful during the early stages of diagnosis, being able to include data from people in the earlier stages of diagnosis would therefore be particularly advantageous.

The study used valid and reliable patient reported outcome measures. The HADS (Zigmond & Snaith, 1983) has been widely utilised within the oncology population and shown to demonstrate good internal consistency (Annunziata et al., 2019). The CancerDQoL is the only individualised measure of cancer-specific QoL available, which is advantageous because it takes account of the importance and relevance of domains of life for the individual, when considering the impact of cancer on QoL (Davidson et al., 2022). Measurement of cancer-specific QoL as an outcome is also in accordance with the NHS 10-year plan which views QoL as a primary outcome for people with cancer and seeks to ensure QoL is assessed

and monitored over time (Department of Health, 2022). The MPFI was used to assess PF, with the validity of the measure in relation to the construct of PF well recognised (Cherry et al., 2021). However, notwithstanding the strengths of the measures, it is important to note that all outcome measures were completed via self-report, leaving them vulnerable to social-desirability bias and demand characteristics (Chritensen et al., 2014; Newell et al., 1999). Additionally, whilst a certain degree of flexibility was required in relation to VAS measure completion, the retrospective responses that were submitted by two participants do compromise the reliability of the data provided.

This study additionally looked at how bothered participants were by their fatigue and pain. The experience of physiological symptoms post ACT intervention is recognised to be an area in need of further research, with a recent systematic review finding only five ACT-based studies included measures of physical distress (Zhao et al., 2021). Whilst the inclusion of VAS measures is a notable strength of the current study, analysis to determine whether a change in ACT process preceded a change in VAS outcome was not conducted due to time limitations. Future research exploring via cross lag analysis whether a change in psychological flexibility or inflexibility occurred before a change in physical distress may be of particular interest and help to address a recognised need for further understanding as to the relationship between ACT processes and outcome (Hayes et al., 2012).

ACT studies are often criticised for their lack of follow-up periods (e.g., Rost et al., 2012). Being able to include a follow-up period within this study to see whether outcomes were maintained four weeks post-intervention is therefore a methodological strength. Owing to time limitations however, it was not possible to monitor outcomes for longer than four weeks. Four weeks is a relatively short timeframe within which to monitor if outcomes are maintained. Further research which recognises the need to monitor psychological outcomes for people living with cancer over a longer period of follow-up would be advantageous (Niedzwiedz et al., 2019).

### **Implications and Recommendations**

The present study was the first to look at whether an online ACT intervention would be acceptable and feasible for use for people living with cancer and to examine its preliminary effectiveness in relation to

psychological outcomes and QoL. This study has subsequently contributed to the growing area of web-based health interventions, with subsequent implications for the utilisation and research of technology-based mental health interventions for people living with cancer.

The acceptability of the online intervention was demonstrated both through the client satisfaction questionnaire and through additional positive qualitative feedback. This acceptability indicates that online ACT-based interventions are an area worthy of investment and development, particularly given the limited health-management resources available (Willems et al., 2020), the number of patients reporting inadequate psychological support (Macmillan, 2015), and previous findings suggesting that online interventions are a necessary component of cancer care (Willems et al., 2020). However, whilst encouraging, it is suggested that further research is conducted utilising a larger and more representative sample so that the findings can be extrapolated to the wider cancer population. Further research would also benefit from monitoring potentially confounding variables such as the extent of engagement with materials and home practice (Lloyd et al., 2018). The adoption of a quantitative self-report home-practice measure may also be useful to explore the relationship between home-practice and clinical outcomes.

Greater unity in the utilisation of well validated condition-specific outcome measures across ACT-based studies is additionally advocated for, particularly in relation to QoL (Bradley, 2001). In line with the government's pledge to monitor QoL outcomes post cancer diagnosis, the adoption of a measure which recognises the individualised nature of cancer is paramount. Researchers should continue to utilise cancer-specific measures such as the CancerDQoL (Garden et al., 2022) where possible to reflect this aim. Relatedly, the use of validated measures to enhance understanding around the processes and mechanisms through which ACT evokes change is recommended.

The blended approach adopted within this study was likely to have aided engagement, with the PI working to ensure availability for check in calls and emails. In addition, participants were selected by Maggie's to participate based upon anticipated motivation levels and suitability. Further research exploring the best and least cumbersome ways to aid engagement with the intervention are advised. Additionally, for future studies within the oncology population, utilisation of a broader sample comprising of participants

with varying motivational levels is likely to be advantageous in identifying and exploring barriers to engagement. Further, whilst none of the participants within this study were newly diagnosed, they did however advocate for its potential utility in the earlier stages of treatment. Further research and investment exploring at what point post diagnosis the intervention may be most beneficial to patients is recommended, with adaptive versions being made to accommodate different stages of diagnosis potentially advantageous.

## **Conclusions**

To conclude, the study findings were suggestive of the novel web-based ACT intervention being an acceptable approach for adults living with cancer. Preliminary support for the effectiveness of a brief online ACT intervention in reducing psychological and physiological distress and enhancing QoL using an individualised measure was acquired. Promising results were also found in relation to the ACT processes of psychological flexibility. Considering the study limitations, further research is required utilising a larger more diverse sample and looking at the mechanisms through which change occurs.

## **IV. Impact, Integration and Dissemination**

### **Integration**

Lengthy wait times and substantive post-treatment side effects can make accessing in-person psychological support particularly challenging for people living with cancer (Fuchsia Howard et al., 2014; Absolom et al., 2011). As highlighted by the Covid-19 pandemic, online interventions may hold promise within this patient group, enabling greater flexibility, removal of physical barriers and promoting choice over treatment (Ho et al., 2020). Given the established acceptability of online interventions within oncology (Skrabal Ross et al., 2020) and the potential for such an approach to heighten timely access to treatment (Ho et al., 2020), the main aim of my project was to contribute to the field by developing and evaluating a web-based ACT intervention for people living with cancer. The decision for the intervention to utilise an ACT-based approach reflects a personal interest in ACT as a third wave CBT modality, the growing evidence base advocating for the approach within oncology, and the need for further methodologically robust ACT-based studies (Gonzalez-Fernandez & Fernandez-Rodriguez, 2019).

The SR stemmed from recognising that prior to developing an effective and acceptable online ACT intervention an understanding of current common practice in terms of face-to-face support for people living with cancer was required. Subsequently, the SR sought to review two approaches frequently offered within oncology; directive CBT-based and explorative supportive counselling approaches. Whilst a systematic review had already been conducted looking at ACT within oncology, with encouraging findings pertaining to its use (Gonzalez-Fernandez & Fernandez-Rodriguez, 2019), an understanding of how the treatment modalities compare was lacking. The aim, therefore, was to synthesise the information and establish how ACT compared as an intervention within oncology when held up against two approaches with comparatively well-established evidence bases. Additionally, being conscious of the outcomes-based criticisms that are frequently cited when considering ACT-based studies (Gonzalez-Fernandez & Fernandez-Rodriguez, 2019), I sought to use the SR as an opportunity to enhance my understanding as to the types of outcomes being focussed upon and the measures being used to ascertain this data. The SR found the three



approaches to each offer some beneficial gains in relation to psychological outcomes and QoL. When comparing across approaches, ACT was shown to demonstrate the largest effect sizes in relation to psychological outcomes and QoL.

The substantial study heterogeneity in terms of design, measures and methodological quality made meaningful comparisons within and between interventions somewhat challenging. The need for further methodologically robust ACT studies within oncology was highlighted through the SR. Further, the requirement for greater consensus in relation to the measures used when evaluating psychological distress and QoL was evident. Ensuring personalised care for people living with cancer is a key part of NHS England's long-term plan, with a particular emphasis on longer-term monitoring and improvement of QoL outcomes pledged (Department of health, 2022). As highlighted in the SR, consensus regarding how best to conceptualise and measure QoL is lacking, with adopted measures tending to fuse health status with QoL and failing to recognise the individualised nature of QoL (Bradley, 2001). Additionally, despite physiological distress being a primary target of ACT-based interventions within oncology, and distress being frequently cited by people living with cancer, the SR highlighted a notable lack of emphasis placed upon assessing physiological distress. These identified confines informed the empirical project whereby a methodologically robust Single Case Experimental Design (SCED) was implemented, an individualised measure of QoL (CancerDQoL) was utilised and markers of physical distress were monitored via VAS measures.

### **Reflections on study design**

A SCED-based study was utilised to explore the feasibility and acceptability of a web-based ACT intervention for people living with cancer, in addition to seeking to establish its preliminary effectiveness. Having been shown to be an appropriate methodology within the context of online interventions (Dallery et al., 2013), and one which allows the collection of rich individualised data, SCED was considered an appropriate design to satisfy the study aims and hypotheses. Further, given the time constraints within which the study was taking place, SCED offered a methodologically sound alternative to an RCT study (e.g., Barlow et al., 2008; Kazdin, 2010), through which participants could provide their own control data (Smith,

2012) and sufficient power could be achieved through a relatively small sample of participants (Horner et al., 2005).

However, the use of SCED was not without challenge. Whilst the acquisition of rich individualised data felt particularly important given the nature of cancer and its treatment, the daily measures were reported to be cumbersome by several participants. Being aware of the potentially burdensome nature of the daily measures, and the length of study participation time (between 11 and 13 weeks), I believed that the therapeutic relationship would prove particularly important to support engagement with the study. To this end, planned check in telephone calls and emails were offered to participants, with the additional offer that they could get in touch to discuss any aspects of the study as needed. Whilst I believe this blended approach aided the development of the therapeutic relationship and subsequent engagement, it was a very time-consuming aspect of the study which was challenging to balance alongside other thesis and placement-related demands. Relatedly, the check in calls were unstandardised and the focus of these calls would change depending on what was raised by participants. I found myself being particularly mindful of wanting to support participation without being coercive in any way. I noticed however that not all participants took up the offer of check in calls, preferring instead to communicate via email. Whilst initially I wondered if telephone avoidance may translate into disengagement with the study, this was not found to be the case and highlighted the importance of being able to offer choice where possible throughout the study to aid engagement.

An additional yet related challenge posed was gaps in measurement. Gaps in measurement is recognised to be a problematic aspect of SCED (Franklin et al., 1996), which became more noticeable in this study during the follow-up period. I was mindful of the SR and the criticisms lobbied at previous ACT-based studies regarding a lack of follow-up data and wanted to support participants to continue to engage with the study within this phase as much as possible. Further, I was aware that when entering the follow-up period, participants had been taking part in the study and completing daily measures for a minimum of seven weeks already. Given that research suggests clear communication can reduce attrition (Brueton et al., 2011), I sought to manage expectations regarding the follow-up period within the post-intervention

check in, and to collaboratively consider ways that I could support engagement. I found these telephone calls and interactions with participants to be a particularly enjoyable aspect of the study and felt fortunate to be able to hear their experiences and reflections on life.

To ascertain change utilising a SCED design, outcomes are repeatedly measured across phases (Kazdin, 2019). This repeated monitoring of outcomes enables change to be demonstrated within each participant and enables a high level of experimental control (Turpin, 2001). Consequently, a wealth of data for synthesis and analysis was acquired. Data collection was not complete until early April 2022, subsequently a calm, methodological approach was required to synthesise and analyse the wealth of data comprehensively within the timeframe.

Using this type of online SCED design, it was not possible to know how much individuals differed in terms of treatment dose and or how much time was spent engaging with the module materials each week nor the extent of exercise practice which occurred between modules. If repeating this study with the benefit of hindsight, I would look to acquire this information, perhaps through asking participants to self-report on homework-practice and through obtaining module completion times via the online programme to assess engagement.

## **Recruitment**

The recruitment phase of the study commenced in September 2021, however the first participant was not randomised to baseline until November 2021. The team at Maggie's spent time considering the suitability of the visitors to the centre and working to ensure that participants were in a place where they would be able to engage with the intervention. This selection process, whilst arguably compromising the generalisability of the findings to the wider cancer population was, on reflection, invaluable in ensuring six participants completed the intervention within the timeframe available. The number of participants referred to the study was smaller than anticipated. Given the demands of SCED-based studies and the retention rates found in oncology-based studies generally (Gonzalez et al., 2018), I had hoped to allow for attrition by recruiting approximately 30 participants. Recruitment was slower than anticipated however, with Maggie's seeing less visitors to the clinic than usual due to Covid, and more of these visitors being

within the palliative pathway and subsequently not eligible to participate. In January 2022 the decision was made to supplement recruitment through advertising the study on social media, predominantly within cancer support Facebook groups. Expressed interest via social media was low, however several people responded to a post advertising the study on my social media page saying that they knew of someone who may benefit from participating, but that they didn't feel able to pass on the poster or share the information with them. I wondered whether this was reflective of an avoidance generally to talk about cancer, perhaps finding the conversations uncomfortable to have. The way in which we think and talk about cancer is likely to vary across cultures and be influenced by our own values (Daher, 2012; Juda, 2021). Reflecting on the recruitment process generally, I found this aspect of the thesis somewhat anxiety provoking. As time progressed and the number of referrals from Maggie's remained low, achieving the recruitment target of six participants began to look increasingly unlikely. The fact that six participants were able to see the intervention through in its entirety, despite the low recruitment rate, I believe speaks to the acceptability of the intervention, the time spent by Maggie's and the team in thinking about the suitability of referrals and perhaps the blended approach and availability of the primary investigator.

### **Service user involvement**

Effective service user (SU) involvement plays a fundamental role in safeguarding that a service is accessible, inclusive, high quality and can meet the needs of those who require its services (BPS, 2010). When reflecting on the SU involvement in this study it was helpful to consider the eight different types of participation proposed by Arnstein (1969). In the UK, the development of service user involvement within mental health contexts is reflected through policy developments and legislation from the Department of Health (Cotterell et al., 2011). Following the recommendations to involve service users in research from as early as possible, Maggie's staff helped to identify someone who wished to be involved. The identified SU was not eligible to participate in the study but was very interested in shaping the intervention and the study design. SU feedback was sought in relation to participant information sheets, consent forms, the content of the intervention, measures used and how best to disseminate the findings. We thought together about the demands of the study and ways in which I could best support participants to get the most from

the intervention. As part of these conversations, the SU spoke to the challenges they thought may arise when asking participants to reflect on their emotional states every day through the mood and anxiety VAS measures. This subsequently helped shape the earlier conversations I had with participants on the telephone where I was able to share this feedback, normalise a range of different responses to being asked to complete the measures and consider together how they might manage this aspect of the study. Further, the intervention was able to benefit from helpful feedback in relation to removing a visible clock from one of the modules, as whilst this was intended to be a supportive addition, it was experienced as unnecessarily pressuring. Receiving positive feedback from the SU in respect of the intervention gave me confidence in the quality of the intervention that was being offered to participants. Whilst I was not able to offer any guarantees regarding the benefits of participation, I was able to have honest conversations about the feedback we had received. I felt assured that the intervention had been carefully considered and time and effort had been put into ensuring it was evidence-based and cancer-specific. The intervention had also been considered by a range of different professionals and shaped by SU feedback. We had initially hoped to receive feedback from at least two service users. Due to time constraints, it was only possible to seek input from one SU. I am conscious that this may have led to the SU experiencing the process as more burdensome than it may otherwise have been (DCP, 2008). Further, with the avoidance of tokenistic participation in mind, co-production could have been heightened by co-writing documents such as the PIS and consent form, rather than working together from a version I had already drafted.

### **Intervention development and feedback**

My understanding of the theoretical underpinnings of ACT and the way in which the approach translates into everyday practice was particularly enhanced through the development of the intervention. Being able to access other ACT-based interventions that had been used within a group-based LTC setting (Taylor & Smith, 2013) and within diabetes (Somaini, 2021) was particularly helpful in shaping the intervention. Adapting the module materials and recording the mindfulness-based exercises were the more time-consuming aspects of intervention design, but this was a particularly well received aspect of the intervention. One participant qualitatively feedback that the leaves on the stream exercise specifically

enabled him to let go of intrusive thoughts and sleep at night. When developing the intervention, I had in mind the findings from the SR which highlighted the need for more accessible and effective interventions for this population and felt invested in wanting to adapt the materials into an intervention that would be acceptable, feasible but also effective in reducing psychological distress and improving QoL. Further, at the time of developing the intervention I had acquired experience of working remotely within different contexts, including working with people with LTCS within an IAPT setting and had seen that online support could equate to significant reductions in distress for patients. These experiences, combined with my own interest in ACT, and the literature recommendations of greater accessibility of psychological support for people living with cancer meant that I was particularly enthusiastic about seeing whether this intervention could contribute to the current understanding of effective online interventions within oncology. One of the most challenging aspects I experienced was ensuring that the intervention was appropriately adapted for people living with cancer. I was mindful of wanting to use the right language and of wanting participants to experience the intervention as cancer-specific. Consulting with the SU who piloted the intervention and with the team at Maggie's was particularly helpful in working towards this aim.

Two participants feedback that they felt the intervention would have been particularly helpful when first diagnosed with cancer, they spoke to this time in their lives as being exceptionally isolating and of being consumed with intrusive thoughts. For both participants, diagnosis had happened some time ago which got me reflecting upon the challenges of designing an intervention for people at very different places post diagnosis and the importance of individualised care. I subsequently wondered about the ways that the content of the intervention could be further adapted to encompass a greater range of internal experiences to increase usefulness across stages and cancer type.

Putting the intervention onto the online platform Qualtrics was a learning curve. Having previously considered myself to be relatively technologically able, I found Qualtrics to test that belief with many hours invested trying to understand how the platform worked and how to set up the study so that it ran in accordance with SCED. Whilst initially a daunting undertaking, spending time consulting the Qualtrics manuals and learning from the experiences of peers within the cohort made this a manageable task.

## Impact

### Clinical Impact

The risk of psychological distress following a cancer diagnosis is recognised to persist for many years post-treatment completion (Neizdziejewicz et al., 2019). Improving the availability and effectiveness of psychological support and continuing to monitor QoL outcomes within this population is a priority (Department of health, 2022). Limitations to the SR render conclusions tentative, however both the SR and the ES have potential clinical implications. The findings from the SR suggest that ACT is a conceptually appropriate evidence-based approach for people living with cancer. Further, it holds promise in terms of improvements in psychological distress and QoL (Feros, 2013; Rost, 2012). In sum, the ACT findings from the SR are particularly promising and suggest that further robust ACT-based studies are warranted.

The findings from the ES, although preliminary, suggest that the intervention was acceptable for people living with cancer and further that it led to reductions in low mood and improvements in anxiety, cancer-specific QoL and ratings of physical distress. These findings were in keeping with other studies which have looked at ACT within a group-based format. Participant feedback suggested that the intervention was informative, easy to understand and beneficial. The findings from the ES highlight the possibilities and promising outcomes of online interventions within this population. Further, online psychological interventions may go some way in helping reduce the length of waiting times for psychological support for oncology patients. It may be that for some patients, a standalone online intervention is sufficient, whilst for others it could help bridge that gap whilst waiting for face-to-face support. If feasible within services, perhaps offering a blended approach with check in calls or emails for participants completing the online intervention may be advantageous. Further, if funding was available, there are arguably possibilities to develop the intervention further with the feedback subsequently received. Given the encouraging findings, perhaps developing different versions of the intervention depending upon the stage of cancer may be worthy of consideration.

ACT within oncology is still within its relative infancy, hopefully by demonstrating through the intervention how ACT and the associated activities may translate into a psychological intervention,

clinicians working within oncology may be encouraged to consider greater utilisation within their own clinical practice. Additionally, the ES has demonstrated the viability of using the CancerDQoL as a means through which to monitor impact and change in the areas of QoL deemed most important to the individual. This study along with the governments pledged focus on the monitoring of QoL outcomes within oncology may aid greater adoption of the measure within clinical practice.

### **Academic Impact**

Through the SR, ACT has been shown to be an approach which can be equally as beneficial to patients as the more frequently adopted approaches of CBT and supportive counselling. The need for more methodologically robust studies was highlighted. Given the potential benefits, clinicians and researchers will be encouraged to conduct further studies looking at ACT within oncology whilst addressing these methodological criticisms. Future studies are advised to consider follow-up periods, the adoption of validated condition-specific outcome measures and measures which assess the impact of ACT in relation to psychological distress such as the physical distress VAS measure included in this study.

The ES demonstrated the viability of ACT as a digital health intervention for people living with cancer. This may subsequently be an area which attracts the attention of researchers with the potential for other ACT-based online interventions to be researched and considered in relation to the findings of this study. The ES demonstrated how SCED can be utilised to meet the aims of the study and has considered ways through which some of the limitations may be addressed in future research (e.g., recruiting more diverse participant sample to increase the generalisability of findings). Further, researchers with an interest in ACT and QoL within cancer may wish to build upon the findings in relation to cancer specific QoL, perhaps through using the CancerDQoL to identify aspects of life which are most important and enabling these to be used as targets for values-driven goals. Additionally, it is important to increase understanding of the processes through which ACT evokes change, researchers may wish to build upon the finding that an increase in psychological flexibility was found post intervention to further consider the mechanisms and processes of change. To this end, larger studies with more representative samples and diverse range of characteristics are required.



## Dissemination

Efforts to disseminate the findings of research should be made irrespective of insignificant outcomes (Mlinarić et al., 2017). To maximise the impact and reach of the SR and the ES, findings will be disseminated to a variety of audiences. In accordance with best practice guidelines (HRA, 2018), study participants who have opted in will be provided with a lay summary of the findings. Additionally, the summary will be posted on the social media platforms from which participants were recruited and shared with Maggie's, Royal Marsden to further disseminate with other Maggie's Centres and on social media.

The results of the empirical study were disseminated with fellow trainee clinical psychologists and course staff at Royal Holloway, University of London via online presentation. The thesis will also be made available to staff and trainees via the universities system Pure. It is hoped that others will be encouraged by the preliminary results of this study and that future research may continue to build upon the findings.

The intention is for both the SR and the ES to be published in peer reviewed academic journals. Consideration is being given to possible appropriate journals at present, with Psycho-Oncology and the Journal of Contextual Behavioural Science both being suitable options. Further dissemination of the overall findings is planned via presentations at appropriate conferences, with the study due to be presented as part of a symposium on ACT for health problems at the Contextual Behavioural Science (ACBS) 2022 conference. Reaching as wide an audience as possible will work to increase awareness of the potential benefits of ACT within oncology, it's effectiveness and acceptability when adapted online, and hopefully stimulate further research into the area.

## V. References

- Aaronson, N. K., Ahmedzai, S., Bergman, B., Bullinger, M., Cull, A., Duez, N. J., Filiberti, A., Flechtner, H., Fleishman, S. B., & de Haes, J. C. (1993). The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *Journal of the National Cancer Institute*, 85(5), 365–376.  
<https://doi.org/10.1093/jnci/85.5.365>
- Absolom, K., Holch, P., Pini, S., Hill, K., Liu, A., Sharpe, M., Richardson, A., Velikova, G., & NCRI COMPASS Supportive and Palliative Care Research Collaborative (2011). The detection and management of emotional distress in cancer patients: the views of health-care professionals. *Psycho-oncology*, 20(6), 601–608. <https://doi.org/10.1002/pon.1916>
- Adler, N. E., Page, A., & Institute of Medicine (US) Committee on Psychosocial Services to Cancer Patients/Families in a Community Setting (Eds.). (2008). *Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs*. National Academies Press (US).
- Annunziata, M. A., Muzzatti, B., Bidoli, E., Flaiban, C., Bomben, F., Piccinin, M., Gipponi, K. M., Mariutti, G., Busato, S., & Mella, S. (2020). Hospital Anxiety and Depression Scale (HADS) accuracy in cancer patients. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*, 28(8), 3921–3926. <https://doi.org/10.1007/s00520-019-05244-8>
- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of planners*, 35(4), 216-224.
- Barlow, D. H., Nock, M., & Hersen, M. (2008). Single case research designs: Strategies for studying behavior change.
- Beckham, G. (2016). Effect Size Calculator.  
<http://georgebeckham.com/2016/cohens-d-and-hedges-g-excel-calculator/>
- Blanco, C., Markowitz, J. C., Hellerstein, D. J., Nezu, A. M., Wall, M., Olfson, M., Chen, Y., Levenson, J., Onishi, M., Varona, C., Okuda, M., & Hershman, D. L. (2019). A randomized trial of interpersonal psychotherapy, problem solving therapy, and supportive therapy for major depressive disorder in

women with breast cancer. *Breast cancer research and treatment*, 173(2), 353–364.

<https://doi.org/10.1007/s10549-018-4994-5>

Bloom, J. R., Stewart, S. L., Oakley-Girvan, I., Banks, P. J., & Shema, S. (2012). Quality of life of younger breast cancer

survivors: persistence of problems and sense of well-being. *Psycho-oncology*, 21(6), 655–665.

<https://doi.org/10.1002/pon.1965>

Bradley, C., Todd, C., Gorton, T., Symonds, E., Martin, A., & Plowright, R. (1999). The development of an individualized questionnaire measure of perceived impact of diabetes on quality of life: The ADDQoL. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, 8(1–2), 79– 91.

Bradley C. (2001). Importance of differentiating health status from quality of life. *Lancet (London, England)*, 357(9249), 7–8. [https://doi.org/10.1016/S0140-6736\(00\)03562-5](https://doi.org/10.1016/S0140-6736(00)03562-5)

Branstetter, A.D., Wilson, K.G., Hildebrandt, M., & Mutch, D. (2004) *Improving psychological adjustment among cancer patients: ACT and CBT. The meeting of the association for advancement of behavior therapy*. New Orleans, LA.

Brazier, J., & Ratcliffe, J. (2017). *Measurement and valuation of health for economic evaluation*.

International Encyclopedia of Public Health (Second Edition). Academic.

Breitbart, W., Poppito, S., Rosenfeld, B., Vickers, A. J., Li, Y., Abbey, J., Olden, M., Pessin, H.,

Lichtenthal, W., Sjoberg, D., & Cassileth, B. R. (2012). Pilot randomized controlled trial of individual meaning-centered psychotherapy for patients with advanced cancer. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*, 30(12), 1304–1309.

<https://doi.org/10.1200/JCO.2011.36.2517>

Bringmann, H., Singer, S., Höckel, M., Stolzenburg, J. U., Krauß, O., & Schwarz, R. (2008). Long-term

course of psychiatric disorders in cancer patients: a pilot study. *Psycho-social medicine*, 5, Doc03.

British Psychological Society. (2010). Good Practice Guidelines to support the involvement of Service Users

and Carers in Clinical Psychology Services.

<https://consaludmental.org/publicaciones/Goodpracticeinvolvementserviceuserscarersclinicalpsychologyservices.pdf>

Brothers, B. M., Yang, H. C., Strunk, D. R., & Andersen, B. L. (2011). Cancer patients with major depressive disorder: testing a biobehavioral/cognitive behavior intervention. *Journal of consulting and clinical psychology*, 79(2), 253–260. <https://doi.org/10.1037/a0022566>

Boland, A., Cherry, G., & Dickson, R. (2017). *Doing a systematic review: A student's guide*. Second Edition. Sage.

Brueton, V., Tierney, J., Stenning, S., Nazareth, I., Meredith, S., Harding, S., & Rait, G. (2011). Strategies to reduce attrition in randomised trials. *Trials*, 12(Suppl 1), A128. <https://doi.org/10.1186/1745-6215-12-S1-A128>

Bulli, F., Miccinesi, G., Maruelli, A., Katz, M., and Paci, E. (2008). The measure of psychological distress in cancer patients: the use of Distress Thermometer in the Oncological Rehabilitation Center of Florence. *Support. Care Cancer* 17, 771. doi: 10.1007/s00520-008-0543-9

Bultz, B. D., & Carlson, L. E. (2006). Emotional distress: the sixth vital sign--future directions in cancer care. *Psycho-oncology*, 15(2), 93–95. <https://doi.org/10.1002/pon.1022>

Button, K. S., Wiles, N. J., Lewis, G., Peters, T. J., & Kessler, D. (2012). Factors associated with differential response to online cognitive behavioural therapy. *Social psychiatry and psychiatric epidemiology*, 47(5), 827–833. <https://doi.org/10.1007/s00127-011-0389-1>

Cancer Research UK. (2018). *Cancer statistics for the UK*. Retrieved from <https://www.cancerresearchuk.org/health-professional/cancer-statistics-for-the-uk#heading-Three>

Cella, D F, Tulsky, D. S., Gray, G., Sarafian, B., Linn, E., Bonomi, A., Silberman, M., Yellen, S. B., Winicour, P., & Brannon, J. (1993). The Functional Assessment of Cancer Therapy scale: Development and validation of the general measure. *Journal of Clinical Oncology*, 11(3), 570–579. <https://doi.org/10.1200/JCO.1993.11.3.570>

Centre for Reviews and Dissemination (CRD). (2009). *CRD's guidance for undertaking reviews in healthcare*.

- Chakraborty, S., & Rahman, T. (2012). The difficulties in cancer treatment. *Ecancermedicalscience*, 6, ed16.  
<https://doi.org/10.3332/ecancer.2012.ed16>
- Charmaz, K. (2002). Stories and Silences: Disclosures and Self in Chronic Illness. *Qualitative Inquiry*, 8(3), 302–328. <https://doi.org/10.1177/107780040200800307>
- Cherry, K. M., Hoeven, E. V., Patterson, T. S., & Lumley, M. N. (2021). Defining and measuring "psychological flexibility": A narrative scoping review of diverse flexibility and rigidity constructs and perspectives. *Clinical psychology review*, 84, 101973. Advance online publication.  
<https://doi.org/10.1016/j.cpr.2021.101973>
- Christensen, A. I., Ekholm, O., Glümer, C., & Juel, K. (2014). Effect of survey mode on response patterns: comparison of face-to-face and self-administered modes in health surveys. *European journal of public health*, 24(2), 327–332. <https://doi.org/10.1093/eurpub/ckt067>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). New York: Academic Press.
- Cook, M. B., Dawsey, S. M., Freedman, N. D., Inskip, P. D., Wichner, S. M., Quraishi, S. M., Devesa, S. S., & McGlynn, K. A. (2009). Sex disparities in cancer incidence by period and age. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*, 18(4), 1174–1182.  
<https://doi.org/10.1158/1055-9965.EPI-08-1118>
- Cooper, G., & Hausman, R. (2004). *The cell*. ASM Press.
- Corbett, T. K., Groarke, A., Devane, D., Carr, E., Walsh, J. C., & McGuire, B. E. (2019). The effectiveness of psychological interventions for fatigue in cancer survivors: systematic review of randomised controlled trials. *Systematic reviews*, 8(1), 324.  
<https://doi.org/10.1186/s13643-019-1230-2>
- Cotterell, P., Harlow, G., Morris, C., Beresford, P., Hanley, B., Sargeant, A., Sitzia, J., & Staley, K. (2011).

Service user involvement in cancer care: the impact on service users. *Health expectations : an international journal of public participation in health care and health policy*, 14(2), 159–169.  
<https://doi.org/10.1111/j.1369-7625.2010.00627.x>

Cunningham, A. J., & Watson, K. (2004). How Psychological Therapy may Prolong Survival in Cancer Patients: New Evidence and a Simple Theory. *Integrative Cancer Therapies*, 214-229.  
<https://doi.org/10.1177/1534735404267553>

Cutillo, A., O'Hea, E., Person, S., Lessard, D., Harralson, T., & Boudreaux, E. (2017). The Distress Thermometer: Cutoff Points and Clinical Use. *Oncology nursing forum*, 44(3), 329–336.  
<https://doi.org/10.1188/17.ONF.329-336>

Daher M. (2012). Cultural beliefs and values in cancer patients. *Annals of oncology : official journal of the European Society for Medical Oncology*, 23 Suppl 3, 66–69.  
<https://doi.org/10.1093/annonc/mds091>

Dallery, J., Cassidy, R. N., & Raiff, B. R. (2013). Single-Case Experimental Designs to Evaluate Novel Technology-Based Health Interventions. *J Med Internet Res*, 15(2), e22.  
<https://doi.org/10.2196/jmir.2227>

Dalton, J. A., Keefe, F. J., Carlson, J., & Youngblood, R. (2004). Tailoring cognitive-behavioral treatment for cancer pain. *Pain management nursing : official journal of the American Society of Pain Management Nurses*, 5(1), 3–18. [https://doi.org/10.1016/s1524-9042\(03\)00027-4](https://doi.org/10.1016/s1524-9042(03)00027-4)

Davidson, J. (2020) *Evaluation of an individualised quality of life questionnaire for use in people with cancer, the Cancer Dependent Quality of Life ("CancerDQoL") questionnaire* [Doctoral thesis, Royal Holloway, University of London].

Davidson, J., Taylor, M., Gilbride, C., Romaine, J., Tipples, K., Powell, M., Wolstenholme, V., Bradley, C. (in press). Psychometric Evaluation of an Individualised Measure of the Impact of Cancer and its Treatment on Quality of Life: The Cancer Dependent Quality of Life (CancerDQoL) Questionnaire. *Value in Health* (submitted).

Department of Health. (2022). *10-Year Cancer Plan: Call for Evidence*.

- Donkin, L., Christensen, H., Naismith, S. L., Neal, B., Hickie, I. B., & Glozier, N. (2011). A systematic review of the impact of adherence on the effectiveness of e-therapies. *Journal of medical Internet research*, 13(3), e52. <https://doi.org/10.2196/jmir.1772>
- Dores, A. R., Carvalho, I. P., Burkauskas, J., and Simonato, P. (2021). Exercise and use of enhancement drugs at the time of the COVID-19 pandemic: a multicultural study on coping strategies during self-isolation and related risks. *Front. Psychiatry* 12:648501. doi: 10.3389/fpsyt.2021.648501
- Douglas, S. L., Pignatello, G., Park, S., & Lipson, A. R. (2020). Psychometric properties of a single-item visual analog scale measuring goals of care in patients with advanced cancer. *Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation*, 29(7), 1999–2005. <https://doi.org/10.1007/s11136-020-02458-w>
- Duncan, M., Moschopoulou, E., Herrington, E., Deane, J., Roylance, R., Jones, L., Bourke, L., Morgan, A., Chalder, T., Thaha, M. A., Taylor, S. C., Korszun, A., White, P. D., Bhui, K., & SURECAN Investigators (2017). Review of systematic reviews of non-pharmacological interventions to improve quality of life in cancer survivors. *BMJ open*, 7(11), e015860. <https://doi.org/10.1136/bmjopen-2017-015860>
- Edelman, S., Craig, A., & Kidman, A. D. (2000). Can psychotherapy increase the survival time of cancer patients? *Journal of Psychosomatic Research*, 49(2), 149-156. [https://doi.org/10.1016/S0022-3999\(00\)00153-7](https://doi.org/10.1016/S0022-3999(00)00153-7)
- Fashler, S. R., Weinrib, A. Z., Azam, M. A., & Katz, J. (2018). The Use of Acceptance and Commitment Therapy in Oncology Settings: A Narrative Review. *Psychological reports*, 121(2), 229–252. <https://doi.org/10.1177/0033294117726061>
- Ferlay, J., Colombet, M., Soerjomataram, I., Mathers, C., Parkin, D. M., Piñeros, M., Znaor, A., & Bray, F. (2019). Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. *International journal of cancer*, 144(8), 1941–1953. <https://doi.org/10.1002/ijc.31937>

- Fernández-Álvarez, J., Díaz-García, A., González-Robles, A., Baños, R., García-Palacios, A., & Botella, C. (2017). Dropping out of a transdiagnostic online intervention: A qualitative analysis of client's experiences. *Internet interventions*, 10, 29–38. <https://doi.org/10.1016/j.invent.2017.09.001>
- Feros, D. L., Lane, L., Ciarrochi, J., & Blackledge, J. T. (2013). Acceptance and Commitment Therapy (ACT) for improving the lives of cancer patients: a preliminary study. *Psycho-oncology*, 22(2), 459–464. <https://doi.org/10.1002/pon.2083>
- Fors, E. A., Bertheussen, G. F., Thune, I., Juvet, L. K., Elvsaas, I. K., Oldervoll, L., Anker, G., Falkmer, U., Lundgren, S., & Leivseth, G. (2011). Psychosocial interventions as part of breast cancer rehabilitation programs? Results from a systematic review. *Psycho-oncology*, 20(9), 909–918. <https://doi.org/10.1002/pon.1844>
- Foster, N. R., Mandrekar, S. J., Schild, S. E., Nelson, G. D., Rowland, K. M., Jr, Deming, R. L., Kozelsky, T. F., Marks, R. S., Jett, J. R., & Adjei, A. A. (2009). Prognostic factors differ by tumor stage for small cell lung cancer: a pooled analysis of North Central Cancer Treatment Group trials. *Cancer*, 115(12), 2721–2731. <https://doi.org/10.1002/cncr.24314>
- Franklin, R. D., Gorman, B. S., Beasley, T. M., & Allison, D. B. (1996). Graphical display and visual analysis.
- Fuchsia Howard, A., Smillie, K., Turnbull, K., Zirul, C., Munroe, D., Ward, A., Tobin, P., Kazanjian, A., & Olson, R. (2014). Access to medical and supportive care for rural and remote cancer survivors in northern British Columbia. *The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association*, 30(3), 311–321. <https://doi.org/10.1111/jrh.12064>
- Ganz, P. A., Desmond, K. A., Leedham, B., Rowland, J. H., Meyerowitz, B. E., & Belin, T. R. (2002). Quality of life in long-term, disease-free survivors of breast cancer: a follow-up study. *Journal of the National Cancer Institute*, 94(1), 39–49. <https://doi.org/10.1093/jnci/94.1.39>
- Garden, A., Taylor, M. D., Davidson, J., Gilbride, C. J., & Bradley, C. (2022). Design of an individualised



questionnaire to measure the impact of cancer on quality of life: The cancer dependent quality of life (CancerDQoL) questionnaire. *Psycho-oncology*, 31(1), 157–162.

<https://doi.org/10.1002/pon.5786>

Gast, D. L. (2005). Visual analysis of graphic data. In G. Sugai & R. Horner (Eds.), *Encyclopedia of behavior modification and cognitive behavior therapy: Educational applications* (Vol. 3, pp. 1595–1599). Thousand Oaks, CA: Sage.

Gilligan, A. M., Alberts, D. S., Roe, D. J., & Skrepnek, G. H. (2018). Death or Debt? National Estimates of Financial Toxicity in Persons with Newly-Diagnosed Cancer. *The American journal of medicine*, 131(10), 1187–1199.e5. <https://doi.org/10.1016/j.amjmed.2018.05.020>

Greer S. (2008). CBT for emotional distress of people with cancer: some personal observations. *Psycho-oncology*, 17(2), 170–173. <https://doi.org/10.1002/pon.1205>

Greer, J. A., Park, E. R., Prigerson, H. G., & Safren, S. A. (2010). Tailoring Cognitive-Behavioral Therapy to Treat Anxiety Comorbid with Advanced Cancer. *Journal of cognitive psychotherapy*, 24(4), 294–313. <https://doi.org/10.1891/0889-8391.24.4.294>

Griffiths, F., Lindenmeyer, A., Powell, J., Lowe, P., & Thorogood, M. (2006). Why are health care interventions delivered over the internet? A systematic review of the published literature. *Journal of Medical Internet Research*, 8(2), e10. <https://doi.org/10.2196/jmir.8.2.e10>

Grimmett, C., Corbett, T., Brunet, J., Shepherd, J., Pinto, B. M., May, C. R., & Foster, C. (2019). Systematic review and meta-analysis of maintenance of physical activity behaviour change in cancer survivors. *The international journal of behavioral nutrition and physical activity*, 16(1), 37. <https://doi.org/10.1186/s12966-019-0787-4>

González-Fernández, S., & Fernández-Rodríguez, C. (2019). Acceptance and Commitment Therapy in Cancer: Review of Applications and Findings. *Behavioral medicine (Washington, D.C.)*, 45(3), 255–269. <https://doi.org/10.1080/08964289.2018.1452713>

Guarino, A., Polini, C., Forte, G., Favieri, F., Boncompagni, I., & Casagrande, M. (2020). The

- effectiveness of psychological treatments in women with breast cancer: A systematic review and meta-analysis. *Journal of Clinical Medicine*, 9(1), 209. <https://doi.org/10.3390/jcm9010209>
- Hadlandsmayth, K., Dindo, L. N., Wajid, R., Sugg, S. L., Zimmerman, M. B., & Rakel, B. A. (2019). A single-session acceptance and commitment therapy intervention among women undergoing surgery for breast cancer: A randomized pilot trial to reduce persistent postsurgical pain. *Psycho-oncology*, 28(11), 2210–2217. <https://doi.org/10.1002/pon.5209>
- Hamilton, W., Peters, T. J., Bankhead, C., & Sharp, D. (2009). Risk of ovarian cancer in women with symptoms in primary care: population based case-control study. *BMJ (Clinical research ed.)*, 339, b2998. <https://doi.org/10.1136/bmj.b2998>
- Hanratty, B., Holland, P., Jacoby, A., & Whitehead, M. (2007). Financial stress and strain associated with terminal cancer--a review of the evidence. *Palliative medicine*, 21(7), 595–607. <https://doi.org/10.1177/0269216307082476>
- Harris, R. (2009). *ACT made simple: An easy-to-read primer on acceptance and commitment therapy*. Oakland, CA: New Harbinger Publications, Inc.
- Harrison, J. D., Young, J. M., Price, M. A., Butow, P. N., & Solomon, M. J. (2009). What are the unmet supportive care needs of people with cancer? A systematic review. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*, 17(8), 1117–1128. <https://doi.org/10.1007/s00520-009-0615-5>
- Hayes, S. C., Bisset, R. T., Korn, Z., Zettle, R. D., Rosenfarb, I. S., Cooper, L. D., & Grundt, A. M. (1999). The impact of acceptance versus control rationales on pain tolerance. *The Psychological Record*, 49(1), 33-47.
- Hayes, S. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, 35(4), [https://doi.org/10.1016/s0005-7894\(04\)80013-3](https://doi.org/10.1016/s0005-7894(04)80013-3)
- Hayes, S. C., & Smith, S. (2005). *Get out of your mind and into your life: The new Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger.

- Hayes, S. C., Levin, M. E., Plumb-Villardaga, J., Villatte, J. L., & Pistorello, J. (2013). Acceptance and commitment therapy and contextual behavioral science: examining the progress of a distinctive model of behavioral and cognitive therapy. *Behavior therapy*, 44(2), 180–198.  
<https://doi.org/10.1016/j.beth.2009.08.002>
- Health Research Authority (HRA). (2018, 19 March). *Publication and dissemination of research findings*.  
<https://www.hra.nhs.uk/planning-and-improving-research/best-practice/publication-and-dissemination-research-findings/>
- Hedges, L. V., Pustejovsky, J. E., & Shadish, W. R. (2012). A standardized mean difference effect size for single case designs. *Research Synthesis Methods*, 3(3), 224-239.  
<https://doi.org/10.1002/jrsm.1052>
- Ho, C. S., Chee, C. Y., & Ho, R. C. (2020). Mental Health Strategies to Combat the Psychological Impact of Coronavirus Disease 2019 (COVID-19) Beyond Paranoia and Panic. *Annals of the Academy of Medicine, Singapore*, 49(3), 155–160.
- Ho, R. T., Fong, T. C., Lo, P. H., Ho, S. M., Lee, P. W., Leung, P. P., Spiegel, D., & Chan, C. L. (2016). Randomized controlled trial of supportive-expressive group therapy and body-mind-spirit intervention for Chinese non-metastatic breast cancer patients. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*, 24(12), 4929–4937.  
<https://doi.org/10.1007/s00520-016-3350-8>
- Holland, J. C., Andersen, B., Breitbart, W. S., Buchmann, L. O., Compas, B., Deshields, T. L., Dudley, M. M., Fleishman, S., Fulcher, C. D., Greenberg, D. B., Greiner, C. B., Handzo, G. F., Hoofring, L., Hoover, C., Jacobsen, P. B., Kvale, E., Levy, M. H., Loscalzo, M. J., McAllister-Black, R., Mechanic, K. Y., ... Freedman-Cass, D. A. (2013). Distress management. *Journal of the National Comprehensive Cancer Network : JNCCN*, 11(2), 190–209. <https://doi.org/10.6004/jnccn.2013.0027>
- Honda, K., Goodwin, R. D., & Neugut, A. I. (2005). The associations between psychological distress and cancer prevention practices. *Cancer detection and prevention*, 29(1), 25–36.  
<https://doi.org/10.1016/j.cdp.2004.08.004>

- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Worlery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71(2), 165-179. <https://doi.org/10.1177/001440290507100203>
- Hulbert-Williams, N. J., Storey, L., & Wilson, K. G. (2015). Psychological interventions for patients with cancer: psychological flexibility and the potential utility of Acceptance and Commitment Therapy. *European journal of cancer care*, 24(1), 15–27. <https://doi.org/10.1111/ecc.12223>
- Hulbert-Williams, N. J., Beatty, L., & Dhillon, H. M. (2018). Psychological support for patients with cancer: evidence review and suggestions for future directions. *Current opinion in supportive and palliative care*, 12(3), 276–292. <https://doi.org/10.1097/SPC.0000000000000360>
- Husson, O., Poort, H., Sansom-Daly, U. M., Netea-Maier, R., Links, T., & Mols, F. (2020). Psychological Distress and Illness Perceptions in Thyroid Cancer Survivors: Does Age Matter?. *Journal of adolescent and young adult oncology*, 9(3), 375–383. <https://doi.org/10.1089/jayao.2019.0153>
- Hunt, S.M. The problem of quality of life. *Qual Life Res*, 6, 0 (1997).  
<https://doi.org/10.1023/A:1026402519847>
- Hyland, K. A., Hoogland, A. I., Gonzalez, B. D., Nelson, A. M., Lechner, S., Tyson, D. M., Barata, A., Gomez, M. F., Antoni, M. H., Small, B., Meade, C. D., Jacobsen, P. B., & Jim, H. (2019). Evaluation of the Psychometric and Structural Properties of the Spanish Version of the Hospital Anxiety and Depression Scale in Latina Cancer Patients. *Journal of pain and symptom management*, 58(2), 289–296.e2. <https://doi.org/10.1016/j.jpainsymman.2019.05.003>
- Ismail, M. F., Lavelle, C., & Cassidy, E. M. (2017). Steroid-induced mental disorders in cancer patients: a systematic review. *Future oncology (London, England)*, 13(29), 2719–2731.  
<https://doi.org/10.2217/fon-2017-0306>
- Jevenc, A., Nikolaichu, C., & Williamson, H. (1998). A Model for Counselling Cancer Patients. *Canadian Journal of Counselling*, 32(3), 213.
- Joyce C. R. (1994). How can we measure individual quality of life?. *Schweizerische medizinische Wochenschrift*, 124(44), 1921–1926.

- Juda, M. (2021). Ways of Thinking and Talking about Cancer. In *Minimal Languages in Action* (pp. 255-279).
- Kangas, M., Milross, C., Taylor, A., & Bryant, R. A. (2012). A pilot randomized controlled trial of a brief early intervention for reducing posttraumatic stress disorder, anxiety and depressive symptoms in newly diagnosed head and neck cancer patients. *Psycho-oncology*, 22(7), 1665–1673. <https://doi.org/10.1002/pon.3208>
- Kazdin, A. E., & Tuma, A. H. (1982). Single-case research designs.
- Kissane, D. W., Grabsch, B., Clarke, D. M., Smith, G. C., Love, A. W., Bloch, S., Snyder, R. D., & Li, Y. (2007). Supportive-expressive group therapy for women with metastatic breast cancer: survival and psychosocial outcome from a randomized controlled trial. *Psycho-oncology*, 16(4), 277–286. <https://doi.org/10.1002/pon.1185>
- Klaassen, Z., Wallis, C., Goldberg, H., Chandrasekar, T., Sayyid, R. K., Williams, S. B., Moses, K. A., Terris, M. K., Nam, R. K., Urbach, D., Austin, P. C., Kurdyak, P., & Kulkarni, G. S. (2019). The impact of psychiatric utilisation prior to cancer diagnosis on survival of solid organ malignancies. *British journal of cancer*, 120(8), 840–847. <https://doi.org/10.1038/s41416-019-0390-0>
- Köhle, N., Drossaert, C.H.C., ten Klooster, P.M., Schreurs, K. M., Hagedoorn, M., Van Uden-Kraan., Verdonck-de Leeuw., & Bohlmeijer, E. T. (2021). Web-based self-help intervention for partners of cancer patients based on acceptance and commitment therapy and self-compassion training: a randomized controlled trial with automated versus personal feedback. *Support Care Cancer* 29, 5115–5125. <https://doi.org/10.1007/s00520-021-06051-w>
- Krasny-Pacini, A., & Evans, J. (2018). Single-case experimental designs to assess intervention effectiveness in rehabilitation: A practical guide. *Annals of physical and rehabilitation medicine*, 61(3), 164–179. <https://doi.org/10.1016/j.rehab.2017.12.002>
- Kratochwill, T. R., Hitchcock, J. H., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2013). Single-case intervention research design standards. *Remedial and Special Education*, 34(1), 26–38. <https://doi.org/10.1177/0741932512452794>
- Kwak, M., Zebrack, B., Meeske, K., Embry, L., Aguilar, C., & Block, R. et al. (2013). Trajectories of

- Psychological Distress in Adolescent and Young Adult Patients With Cancer: A 1-Year Longitudinal Study. *Journal Of Clinical Oncology*, 31(17), 2160-2166. <https://doi.org/10.1200/jco.2012.45.9222>
- Lanovaz, M. J., & Rapp, J. T. (2016). Using Single-Case Experiments to Support Evidence-Based Decisions: How Much Is Enough?. *Behavior modification*, 40(3), 377–395.  
<https://doi.org/10.1177/0145445515613584>
- Larsen, D. L., Attkisson, C. C., Hargreaves, W. A., & Nguyen, T. D. (1979). Assessment of client/patient satisfaction: development of a general scale. *Evaluation and program planning*, 2(3), 197–207.  
[https://doi.org/10.1016/0149-7189\(79\)90094-6](https://doi.org/10.1016/0149-7189(79)90094-6)
- Lee, H., Lim, Y., Yoo, M. S., & Kim, Y. (2011). Effects of a nurse-led cognitive-behavior therapy on fatigue and quality of life of patients with breast cancer undergoing radiotherapy: an exploratory study. *Cancer nursing*, 34(6), E22–E30. <https://doi.org/10.1097/NCC.0b013e31820d1734>
- Leykin, Y., Thekdi, S. M., Shumay, D. M., Muñoz, R. F., Riba, M., & Dunn, L. B. (2012). Internet interventions for improving psychological well-being in psycho-oncology: review and recommendations. *Psycho-oncology*, 21(9), 1016–1025. <https://doi.org/10.1002/pon.1993>
- Lin, S., Chen, Y., Yang, L., & Zhou, J. (2013). Pain, fatigue, disturbed sleep and distress comprised a symptom cluster that related to quality of life and functional status of lung cancer surgery patients. *Journal of clinical nursing*, 22(9-10), 1281–1290. <https://doi.org/10.1111/jocn.12228>
- Lin, J., Paganini, S., Sander, L., Lüking, M., Ebert, D. D., Buhrman, M., Andersson, G. & Baumeister, H. (2017). An internet-based intervention for chronic pain: a three-arm randomized controlled study of the effectiveness of guided and unguided acceptance and commitment therapy. *Deutsches Ärzteblatt International*, 114(41), 681. <https://doi.org/10.3238/arztebl.2017.0681>
- Linardon, J., Gleeson, J., Yap, K., Murphy, K., & Brennan, L. (2019). Meta-analysis of the effects of Third-wave behavioural interventions on disordered eating and body image concerns: implications for eating disorder prevention. *Cognitive behaviour therapy*, 48(1), 15–38.  
<https://doi.org/10.1080/16506073.2018.1517389>
- Lloyd, A., White, R., Eames, C., & Crane, R. (2018). The utility of home- practice in mindfulness-based group

interventions: a systematic review. *Mindfulness*, 9(3), 673-692. <https://doi.org/10.1007/s12671-017-0813-z>

Lobo, M. A., Moeyaert, M., Baraldi Cunha, A., & Babik, I. (2017). Single-Case Design, Analysis, and Quality Assessment for Intervention Research. *Journal of neurologic physical therapy : JNPT*, 41(3), 187–197. <https://doi.org/10.1097/NPT.0000000000000187>

MacMillan. (2015). *The social care needs of people with cancer*. Retrieved from [https://www.macmillan.org.uk/\\_images/hidden-at-home\\_tcm9-301704.pdf](https://www.macmillan.org.uk/_images/hidden-at-home_tcm9-301704.pdf)

Magasi, S., Marshall, H. K., Winters, C., & Victorson, D. (2022). Cancer Survivors' Disability Experiences and Identities: A Qualitative Exploration to Advance Cancer Equity. *International journal of environmental research and public health*, 19(5), 3112. <https://doi.org/10.3390/ijerph19053112>

Massie M. J. (2004). Prevalence of depression in patients with cancer. *Journal of the National Cancer Institute. Monographs*, (32), 57–71. <https://doi.org/10.1093/jncimonographs/lgh014>

Merckaert, I., Libert, Y., Messin, S., Milani, M., Slachmuylder, J. L., & Razavi, D. (2010). Cancer patients' desire for psychological support: prevalence and implications for screening patients' psychological needs. *Psycho-oncology*, 19(2), 141–149. <https://doi.org/10.1002/pon.1568>

Manne, S. L., Rubin, S., Edelson, M., Rosenblum, N., Bergman, C., Hernandez, E., Carlson, J., Rocereto, T., & Winkel, G. (2007). Coping and communication-enhancing intervention versus supportive counseling for women diagnosed with gynecological cancers. *Journal of consulting and clinical psychology*, 75(4), 615–628. <https://doi.org/10.1037/0022-006X.75.4.615>

Mathew, A., Doorenbos, A. Z., Jang, M. K., & Hershberger, P. E. (2021). Acceptance and commitment therapy in adult cancer survivors: a systematic review and conceptual model. *Journal of cancer survivorship : research and practice*, 15(3), 427–451. <https://doi.org/10.1007/s11764-020-00938-z>

McKenna S. P. (2011). Measuring patient-reported outcomes: moving beyond misplaced common sense to hard science. *BMC medicine*, 9, 86. <https://doi.org/10.1186/1741-7015-9-86>

Miller, S.A., & Forrest, J.L. (2001). Enhancing your practice through evidence-based decision making: PICO, learning how to ask good questions. *Journal of Evidence Based Dental Practice*, 1, 136-141.

- Miller, K., Nogueira, L., Mariotto, A., Rowland, J., Yabroff, K., & Alfano, C. et al. (2019). Cancer treatment and survivorship statistics, 2019. *CA: A Cancer Journal For Clinicians*, 69(5), 363-385.  
<https://doi.org/10.3322/caac.21565>
- Mlinarić, A., Horvat, M., & Šupak Smolčić, V. (2017). Dealing with the positive publication bias: Why you  
<https://doi.org/10.11613/BM.2017.030201>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS med*, 6(7), e1000097.  
<https://doi.org/10.1371/journal.pmed.1000097>
- Moorey, S., Greer, S., Bliss, J., & Law, M. (1998). A comparison of adjuvant psychological therapy and supportive counselling in patients with cancer. *Psycho-oncology*, 7(3), 218–228.  
[https://doi.org/10.1002/\(SICI\)1099-1611\(199805/06\)7:3<218::AID-PON308>3.0.CO;2-D](https://doi.org/10.1002/(SICI)1099-1611(199805/06)7:3<218::AID-PON308>3.0.CO;2-D)
- Morley, S. (2017). *Single-case methods in clinical psychology: A practical guide*. (C. Masterson & C. J. Main, Eds.). Routledge/Taylor & Francis Group.
- Moschopoulou, E., Deane, J., Duncan, M., Ismail, S., Moriarty, S., & Sarker, S. et al. (2021). Measuring quality of life in people living with and beyond cancer in the UK. *Supportive Care In Cancer*, 29(10), 6031-6038. <https://doi.org/10.1007/s00520-021-06105-z>
- Mosher, C. E., Krueger, E., Secinti, E., & Johns, S. A. (2021). Symptom experiences in advanced cancer: Relationships to acceptance and commitment therapy constructs. *Psycho-oncology*, 30(9), 1485–1491. <https://doi.org/10.1002/pon.5712>
- Mukherjee, A., Mazumder, K., Kaushal, V., & Ghoshal, S. (2017). Effect of Supportive Psychotherapy on Mental Health Status and Quality of Life of Female Cancer Patients Receiving Chemotherapy for Recurrent Disease. *Indian journal of palliative care*, 23(4), 399–402.  
[https://doi.org/10.4103/IJPC.IJPC\\_73\\_17](https://doi.org/10.4103/IJPC.IJPC_73_17)
- Nayak, M. G., George, A., Vidyasagar, M. S., Mathew, S., Nayak, S., Nayak, B. S., Shashidhara, Y. N., & Kamath, A. (2017). Quality of Life among Cancer Patients. *Indian journal of palliative care*, 23(4), 445–450. [https://doi.org/10.4103/IJPC.IJPC\\_82\\_17](https://doi.org/10.4103/IJPC.IJPC_82_17)



- Newell, S. A., Girgis, A., Sanson-Fisher, R. W., & Savolainen, N. J. (1999). The accuracy of self-reported health behaviors and risk factors relating to cancer and cardiovascular disease in the general population: a critical review. *American journal of preventive medicine*, 17(3), 211–229.  
[https://doi.org/10.1016/s0749-3797\(99\)00069-0](https://doi.org/10.1016/s0749-3797(99)00069-0)
- Newell, S. A., Sanson-Fisher, R. W., & Savolainen, N. J. (2002). Systematic review of psychological therapies for cancer patients: overview and recommendations for future research. *Journal of the National Cancer Institute*, 94(8), 558–584. <https://doi.org/10.1093/jnci/94.8.558>
- NHS England (2021). *Cancer quality of life survey summary report: First data release October 2021*. Retrieved from <https://www.england.nhs.uk/wp-content/uploads/2021/11/Cancer-quality-of-life-survey-summary-report-first-data-release.pdf>
- Niedzwiedz, C., Knifton, L., Robb, K., Katikireddi, S., & Smith, D. (2019). Depression and anxiety among people living with and beyond cancer: a growing clinical and research priority. *BMC Cancer*, 19(1).  
<https://doi.org/10.1186/s12885-019-6181-4>
- Normand M. P. (2016). Less Is More: Psychologists Can Learn More by Studying Fewer People. *Frontiers in psychology*, 7, 934. <https://doi.org/10.3389/fpsyg.2016.00934>
- Ochoa, C., Casellas-Grau, A., Vives, J., Font, A., & Borràs, J. M. (2017). Positive psychotherapy for distressed cancer survivors: Posttraumatic growth facilitation reduces posttraumatic stress. *International journal of clinical and health psychology: IJCHP*, 17(1), 28–37.  
<https://doi.org/10.1016/j.ijchp.2016.09.002>
- Oliver, J. (2013, February 12). *Passengers on a Bus - an Acceptance & Commitment Therapy (ACT) Metaphor* [Video]. YouTube. <https://www.youtube.com/watch?v=Z29ptSuoWRc>
- Osborn, R. L., Demoncada, A. C., & Feuerstein, M. (2006). Psychosocial interventions for depression, anxiety, and quality of life in cancer survivors: meta-analyses. *International journal of psychiatry in medicine*, 36(1), 13–34. <https://doi.org/10.2190/EUFN-RV1K-Y3TR-FK0L>
- Ost L. G. (2014). The efficacy of Acceptance and Commitment Therapy: an updated systematic review and

meta-analysis. *Behaviour research and therapy*, 61, 105–121.

<https://doi.org/10.1016/j.brat.2014.07.018>

Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine nonoverlap techniques. *Behavior Modification*, 35(4), 303-322.

<https://doi.org/10.1177/0145445511399147>

Parker, R. I., & Vannest, K. J. (2012). Bottom-up analysis of single-case research designs. *Journal of Behavioral Education*, 21(3), 254-265. <https://doi.org/10.1007/s10864-012-9153-1>

Paul-Dauphin, A., Guillemin, F., Virion, J. M., & Briançon, S. (1999). Bias and precision in visual analogue scales: a randomized controlled trial. *American journal of epidemiology*, 150(10), 1117–1127.

<https://doi.org/10.1093/oxfordjournals.aje.a009937>

Pitman, A., Suleman, S., Hyde, N., & Hodgkiss, A. (2018). Depression and anxiety in patients with cancer. *BMJ (Clinical research ed.)*, 361, k1415. <https://doi.org/10.1136/bmj.k1415>

Rodgers, J., Martin, C. R., Morse, R. C., Kendell, K., & Verrill, M. (2005). An investigation into the psychometric properties of the Hospital Anxiety and Depression Scale in patients with breast cancer. *Health and quality of life outcomes*, 3, 41. <https://doi.org/10.1186/1477-7525-3-41>

Rogge, R. D., Daks, J. S., Dubler, B. A., & Saint, K. J. (2019). It's all about the process: Examining the convergent validity, conceptual coverage, unique predictive validity, and clinical utility of ACT process measures. *Journal of Contextual Behavioral Science*, 14, 90-102.

Rolffs, J. L., Rogge, R. D., & Wilson, K. G. (2018). Disentangling Components of Flexibility via the Hexaflex Model: Development and Validation of the Multidimensional Psychological Flexibility Inventory (MPFI). *Assessment*, 25(4), 458–482. <https://doi.org/10.1177/1073191116645905>

Rosenberger, J. J., & Gasko, M. (1983). Comparing location estimators: trimmed means, medians and trimean. In D. C. Hoaglin, F. Mosteller & J. W. Tukey (Eds.), *Understanding robust and exploratory data analysis*. New York: Wiley.

Rost, A. D., Wilson, K., Buchanan, E., Hildebrandt, M. J., & Mutch, D. (2012). Improving psychological

adjustment among late-stage ovarian cancer patients: Examining the role of avoidance in treatment. *Cognitive and Behavioral Practice*, 19(4), 508–

517. <https://doi.org/10.1016/j.cbpra.2012.01.003>

Serfaty, M., King, M., Nazareth, I., Moorey, S., Aspden, T., Tookman, A., Mannix, K., Gola, A., Davis, S., Wood, J., & Jones, L. (2019). Manualised cognitive-behavioural therapy in treating depression in advanced cancer: the CanTalk RCT. *Health technology assessment (Winchester, England)*, 23(19), 1–106. <https://doi.org/10.3310/hta23190>

Serfaty, M., King, M., Nazareth, I., Moorey, S., Aspden, T., Mannix, K., Davis, S., Wood, J., & Jones, L. (2020). Effectiveness of cognitive-behavioural therapy for depression in advanced cancer: CanTalk randomised controlled trial. *The British journal of psychiatry : the journal of mental science*, 216(4), 213–221. <https://doi.org/10.1192/bjp.2019.207>

Shadish, W. R., Hedges, L. V., & Pustejovsky, J. E. (2014). Analysis and meta-analysis of single-case designs with a standardized mean difference statistic: a primer and applications. *Journal of school psychology*, 52(2), 123–147. <https://doi.org/10.1016/j.jsp.2013.11.005>

Shapiro C. L. (2018). Cancer Survivorship. *The New England journal of medicine*, 379(25), 2438–2450. <https://doi.org/10.1056/NEJMra1712502>

Shand, L. K., Cowlshaw, S., Brooker, J. E., Burney, S., & Ricciardelli, L. A. (2015). Correlates of post-traumatic stress symptoms and growth in cancer patients: a systematic review and meta-analysis. *Psycho-oncology*, 24(6), 624–634. <https://doi.org/10.1002/pon.3719>

Siegel, R., Miller, K., Fuchs, H., & Jemal, A. (2022). Cancer statistics. *CA: A Cancer Journal for Clinicians*, 72(1), 7-33. <https://doi.org/10.3322/caac.21708>

Singer, S., Das-Munshi, J., & Brähler, E. (2010). Prevalence of mental health conditions in cancer patients in acute care--a meta-analysis. *Annals of oncology : official journal of the European Society for Medical Oncology*, 21(5), 925–930. <https://doi.org/10.1093/annonc/mdp515>

Skrabal Ross, X., Gunn, K. M., Olver, I., Willems, R. A., Lechner, L., Mesters, I., & Bolman, C. (2020). Online

psychosocial interventions for posttreatment cancer survivors: an international evidence review and update. *Current opinion in supportive and palliative care*, 14(1), 40–50.

<https://doi.org/10.1097/SPC.0000000000000478>

Smith H. R. (2015). Depression in cancer patients: Pathogenesis, implications and treatment

(Review). *Oncology letters*, 9(4), 1509–1514. <https://doi.org/10.3892/ol.2015.2944>

Smith J. D. (2012). Single-case experimental designs: a systematic review of published research and current

standards. *Psychological methods*, 17(4), 510–550. <https://doi.org/10.1037/a0029312>

Somaini, G. (2021). *Web-based Acceptance and Commitment Therapy for Type 1 Diabetes A Pilot Study Using Single Case Experimental Design*. [Doctoral Thesis, Royal Holloway University of London].

Stanton, A. L., Collins, C. A., & Sworowski, L. A. (2001). *Handbook of Health Psychology*. Mahwah, NJ: Lawrence Erlbaum Associates. *Adjustment to chronic illness: Theory and research*. Routledge/Taylor & Francis Group.

Strong, V., Waters, R., Hibberd, C., Rush, R., Cargill, A., Storey, D., Walker, J., Wall, L.,

Fallon, M., & Sharpe, M. (2007). Emotional distress in cancer patients: the Edinburgh Cancer Centre symptom study. *British journal of cancer*, 96(6), 868–874. <https://doi.org/10.1038/sj.bjc.6603626>

Sung, H., Ferlay, J., Siegel, R., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021).

Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: A Cancer Journal For Clinicians*, 71(3), 209–249.

<https://doi.org/10.3322/caac.21660>

Swainston, J., Chapman, B., Grunfeld, E. A., & Derakshan, N. (2020). COVID-19 Lockdown and Its Adverse Impact on Psychological Health in Breast Cancer. *Frontiers in psychology*, 11, 2033.

<https://doi.org/10.3389/fpsyg.2020.02033>

Tang, L. L., Zhang, Y. N., Pang, Y., Zhang, H. W., & Song, L. L. (2011). Validation and reliability of distress thermometer in Chinese cancer. *Chinese Journal of Cancer Research*, 23(1), 54–58.

Tatrow, K., & Montgomery, G. H. (2006). Cognitive behavioral therapy techniques for distress and pain in

breast cancer patients: a meta-analysis. *Journal of behavioral medicine*, 29(1), 17–27.

<https://doi.org/10.1007/s10865-005-9036-1>

Taylor, M., & Smith, F. (2013). *Reclaiming Life Support Group* manual [unpublished manual]. Royal Free Hospital Charity.

The EuroQoL Group. (1990). EuroQoL—A new facility for the measurement of health-related quality of life. *Health Policy*, 16(3), 199–208. [https://doi.org/10.1016/0168-8510\(90\)90421-9](https://doi.org/10.1016/0168-8510(90)90421-9)

Thomas, B. H., Ciliska, D., Dobbins, M., & Micucci, S. (2004). A process for systematically reviewing the literature: providing the research evidence for public health nursing interventions. *Worldviews on Evidence-Based Nursing*, 1(3), 176–184. <https://doi.org/10.1111/j.1524-475X.2004.04006.x>

Torre, L., Bray, F., Siegel, R., Ferlay, J., Lortet-Tieulent, J., & Jemal, A. (2015). Global cancer statistics, 2012. *CA: A Cancer Journal For Clinicians*, 65(2), 87–108. <https://doi.org/10.3322/caac.21262>

Trevino, K. M., Healy, C., Martin, P., Canin, B., Pillemer, K., Sirey, J. A., & Reid, M. C. (2018). Improving implementation of psychological interventions to older adult patients with cancer: Convening older adults, caregivers, providers, researchers. *Journal of geriatric oncology*, 9(5), 423–429. <https://doi.org/10.1016/j.jgo.2018.04.007>

UK Health Security Agency. (2021). Cancer registration statistics for England. Retrieved from <https://www.gov.uk/government/collections/cancer-registration-statistics-for-england#cancer-registration-statistics>

van Laerhoven, H., van der Zaag-Loonen, H. J., & Derkx, B. H. (2004). A comparison of Likert scale and visual analogue scales as response options in children's questionnaires. *Acta paediatrica (Oslo, Norway : 1992)*, 93(6), 830–835. <https://doi.org/10.1080/08035250410026572>

Versteegh, M. M., Leunis, A., Uyl-de Groot, C. A., & Stolk, E. A. (2012). Condition-specific preference-based measures: benefit or burden?. *Value in health : the journal of the International Society for Pharmacoeconomics and Outcomes Research*, 15(3), 504–513. <https://doi.org/10.1016/j.jval.2011.12.003>

Vissers, P. A., Thong, M. S., Pouwer, F., Zanders, M. M., Coebergh, J. W., & van de Poll-

Franse, L. V. (2013). The impact of comorbidity on Health-Related Quality of Life among cancer survivors: analyses of data from the PROFILES registry. *Journal of cancer survivorship: research and practice*, 7(4), 602–613. <https://doi.org/10.1007/s11764-013-0299-1>

Walker, J., Hansen, C., Martin, P., Symeonides, S., Ramessur, R., Murray, G., & Sharpe, M. (2014).

Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data. *The Lancet Psychiatry*, 1(5), 343-350.

[https://doi.org/10.1016/s2215-0366\(14\)70313-x](https://doi.org/10.1016/s2215-0366(14)70313-x)

Ware, J. E., Jr, & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Medical care*, 30(6), 473–483.

Wen, S., Xiao, H., & Yang, Y. (2018). The risk factors for depression in cancer patients undergoing chemotherapy: a systematic review. *Supportive Care In Cancer*, 27(1), 57-67.

<https://doi.org/10.1007/s00520-018-4466-9>

Wenzel, L., DeAlba, I., Habbal, R., Kluhsman, B. C., Fairclough, D., Krebs, L. U., Anton-Culver, H., Berkowitz, R., & Aziz, N. (2005). Quality of life in long-term cervical cancer survivors. *Gynecologic oncology*, 97(2), 310–317. <https://doi.org/10.1016/j.ygyno.2005.01.010>

Willems, B., Cullati, S., Prez, V., Jolidon, V., Burton-Jeangros, C., & Bracke, P. (2020). Cancer Screening Participation and Gender Stratification in Europe. *Journal of health and social behavior*, 61(3), 377–395. <https://doi.org/10.1177/0022146520938708>

Williams, S., & Dale, J. (2006). The effectiveness of treatment for depression/depressive symptoms in adults with cancer: a systematic review. *British journal of cancer*, 94(3), 372–390.

<https://doi.org/10.1038/sj.bjc.6602949>

Williams, V.S.L., Morlock, R.J. and Feltner, D. (2010) Psychometric evaluation of a visual analog scale for the assessment of anxiety. *Health Quality of Life Outcomes*, 8(8), 57. <http://dx.doi.org/10.1186/1477-7525-8-57>

Wilson, K. G., & DuFrene, T. (2009). *Mindfulness for Two: An Acceptance and Commitment Therapy*

- Ye, M., Du, K., Zhou, J., Zhou, Q., Shou, M., Hu, B., Jiang, P., Dong, N., He, L., Liang, S., Yu, C., Zhang, J., Ding, Z., & Liu, Z. (2018). A meta-analysis of the efficacy of cognitive behavior therapy on quality of life and psychological health of breast cancer survivors and patients. *Psycho-oncology*, 27(7), 1695–1703. <https://doi.org/10.1002/pon.4687>
- Zabora, J., BrintzenhofeSzoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology*, 10(1), 19-28. [https://doi.org/10.1002/1099-1611\(200101/02\)10:1<19::aid-pon501>3.0.co;2-6](https://doi.org/10.1002/1099-1611(200101/02)10:1<19::aid-pon501>3.0.co;2-6)
- Zhang, M., Huang, L., Feng, Z., Shao, L., & Chen, L. (2017). Effects of cognitive behavioral therapy on quality of life and stress for breast cancer survivors: a meta-analysis. *Minerva medica*, 108(1), 84–93. <https://doi.org/10.23736/S0026-4806.16.04528-6>
- Zhang, Y., & Ma, Z. F. (2020). Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study. *International journal of environmental research and public health*, 17(7), 2381. <https://doi.org/10.3390/ijerph17072381>
- Zhao, C., Lai, L., Zhang, L., Cai, Z., Ren, Z., Shi, C., Luo, W., & Yan, Y. (2021). The effects of acceptance and commitment therapy on the psychological and physical outcomes among cancer patients: A meta-analysis with trial sequential analysis. *Journal of psychosomatic research*, 140, 110304. <https://doi.org/10.1016/j.jpsychores.2020.110304>
- Zhu, J., Sjölander, A., Fall, K., Valdimarsdottir, U., & Fang, F. (2018). Mental disorders around cancer diagnosis and increased hospital admission rate - a nationwide cohort study of Swedish cancer patients. *BMC cancer*, 18(1), 322. <https://doi.org/10.1186/s12885-018-4270-4>
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica Scandinavica*, 67(6), 361–370. <https://doi.org/10.1111/j.1600-0447.1983.tb09716.x>



## VI. Appendices

### Appendix A

Ethical approval from Research Ethics Committee at Royal Holloway, University of London

#### Result of your application to the Research Ethics Committee (application ID 2545)



✉ Ethics Application System <ethics@rhul....

Monday, 19 April 2021 at 23:54

To: ✉ Cox, Hannah (2019); ✉ Kingston, Jessica; ✉ Ethics

PI: Jess Kingston

Project title: Development and pilot testing of an online ACT intervention for improving psychological outcomes and quality of life for adults with cancer.

REC ProjectID: 2545

Your application has been approved by the Research Ethics Committee.

Please report any subsequent changes that affect the ethics of the project to the University Research Ethics Committee [ethics@rhul.ac.uk](mailto:ethics@rhul.ac.uk)

This email, its contents and any attachments are intended solely for the addressee and may contain confidential information. In certain circumstances, it may also be subject to legal privilege. Any unauthorised use, disclosure, or copying is not permitted. If you have received this email in error, please notify us and immediately and permanently delete it. Any views or opinions expressed in personal emails are solely those of the author and do not necessarily represent those of Royal Holloway, University of London. It is your responsibility to ensure that this email and any attachments are virus free.





# PARTICIPANTS NEEDED



**Development and pilot testing of an online Acceptance & Commitment Therapy (ACT) intervention aimed at improving well-being and quality of life of adults living with cancer.**

## **WHAT ARE WE DOING?**

We are looking at whether an online ACT intervention is feasible and acceptable for use with people living with cancer, as well as exploring if it leads to improvements in well-being and quality of life.

## **WHY ARE WE DOING IT?**

Being diagnosed with cancer can negatively impact a person's quality of life and well-being. There is an identified need to develop brief and accessible interventions to support people living with cancer in improving their well-being and quality of life.

## **WHO DO WE NEED?**

We need people who are:

- Aged 18 or over.
- Currently receiving cancer treatment or have recently completed treatment in the past twelve months or are due to be starting treatment.
- Fluent in English.
- Able to access the Internet.
- Experiencing self-reported psychological distress in relation to their physical health (as measured using our screening questionnaire).
- Not receiving psychological treatment elsewhere.

## **WHAT WOULD I NEED TO DO?**

Participants would be involved in the study for either 11, 12 or 13 weeks.

Taking part would involve:

- Completing online questionnaires at predetermined time points.
- Completing one online module a week for 6 weeks.
- Completing some quick online daily measures for the duration of the study.

## **HOW CAN I TAKE PART?**

If you are interested in knowing more/taking part please contact Hannah Cox:

Email: [Hannah.cox.2019@live.rhul.ac.uk](mailto:Hannah.cox.2019@live.rhul.ac.uk)

Telephone: **07940808336**

## Appendix C

### Participant information Sheet



### Participant Information Sheet

#### **Development and pilot testing of an online ACT intervention for improving psychological outcomes and quality of life for adults with cancer.**

You are being invited to take part in the above research study developed at Royal Holloway University of London by Hannah Cox, Trainee Clinical Psychologist, Dr Michelle Taylor, Clinical Psychologist and Dr Jess Kingston, Clinical Psychologist.

Before you decide whether you want to take part, it is important for you to understand why the research is being done and what it will involve.

Please take time to read the following information carefully and discuss it with friends, relatives and relevant health professionals if you wish. Get in touch with the research team using the contact details at the end of this form to ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

---

#### **What is the purpose of the study?**

Research has shown that the being diagnosed with cancer can substantially impact upon a person's wellbeing and quality of life. People can feel trapped in a vicious cycle of low mood and anxiety in relation to their health, which can become difficult to manage and may subsequently impact upon their ability to live life according to what is important to them. Unfortunately, when trying to seek psychological support people with cancer can often be faced with long waiting lists. Additionally, the psychological support offered at present is typically in the form of face-to-face appointments, which can be difficult for people to physically attend for a variety of individual reasons. There is a need to develop brief and accessible interventions to support people living with cancer in improving their wellbeing and quality of life. To meet this need, researchers at Royal Holloway, University of London have developed an online six-week psychological intervention based on the principles of Acceptance and Commitment Therapy (ACT). ACT is an approach that supports individuals in developing a non-judgemental awareness and acceptance of one's internal experiences (e.g. thoughts, feelings, physical sensations), encouraging living a meaningful life according to one's values despite the challenges of living with a chronic condition. ACT is increasingly being used with people with physical health conditions, including cancer, with promising results.

The aim of the study is to assess whether the six-week online ACT intervention is feasible and acceptable for use with people with cancer, as well as exploring its effectiveness in improving wellbeing and quality of life.

### **Why have I been given this invitation?**

You have been given this invitation because you have expressed an interest in taking part in the study. To be able to take part, you must meet the following criteria:

- Be at least 18 years of age.
- Be currently receiving cancer treatment or have recently completed treatment in the past twelve months or be due to start treatment.
- Be fluent in written and spoken English.
- Have access to the Internet.
- Experience self-reported psychological distress in relation to your physical health (as measured using our screening questionnaire).
- Not be receiving psychological treatment elsewhere.

### **Do I have to take part?**

It is up to you to decide whether or not to take part. If you are eligible for the study and you do decide to take part, you will be given this information sheet to keep and you are invited to get in touch with the Chief Investigator, Hannah Cox, using the contact details at the end of this information sheet. If you decide to take part, you are still free to withdraw at any time and without giving a reason. Deciding to withdraw or to not take part in the study will not affect the standard of care you receive in any way.

### **What does taking part involve?**

The study is entirely web-based and will be accessible from home through a link that you will be sent, provided that you have access to the Internet. Participants will be involved in the research from eleven to thirteen weeks.

If you decide to take part in the study, you will be asked to agree and give consent to the following:

<u>Prior to the start of the study</u>	<ul style="list-style-type: none"> <li>• You will complete a screening questionnaire (5-10 minutes) to assess if you are eligible to take part.</li> <li>• We will collect some personal, demographic and medical information from you.</li> </ul>
<u>At the start of the study</u>	<ul style="list-style-type: none"> <li>• You will complete two questionnaires (each could take 5-10 minutes), which ask questions about your wellbeing and quality of life.</li> <li>• You will be asked to wait for either one, two or three weeks to start the Acceptance and Commitment Therapy (ACT) intervention.</li> </ul>
<u>While you wait to start the ACT intervention</u> Duration of this phase: one to three weeks	<ul style="list-style-type: none"> <li>• You will fill in some daily questions for the duration of the study. These measures will ask about your daily mood and anxiety levels,</li> </ul>

	<p>treatment side effects, physical symptoms, fatigue and daily use of mindfulness and value driven behaviours (5 - 10 minutes).</p> <ul style="list-style-type: none"> <li>• At the end of this period you will complete the same two questionnaires you completed at the start of the study (2<sup>nd</sup> time).</li> </ul>
<p><u>During the ACT intervention</u> Duration of this phase: six weeks</p>	<ul style="list-style-type: none"> <li>• Upon accessing the intervention, you will complete an ACT-specific questionnaire (it should take no longer than 5-10 minutes) which looks at things such as your life values, thoughts, feelings and the ability to be focused on the present moment.</li> <li>• You will be asked to access the ACT intervention programme via Qualtrics (a secure computer programme) once a week in the six-week period (a total of six times). There will be a new module each week, including content on your life values, goals, acceptance and mindfulness. You will complete some tasks and practical activities based on ACT (each module could take up to 30-40 minutes to complete).</li> <li>• You will be asked to continue to do some tasks in order to practice the skills you have learned each week. The more you practice the easier they will become. We advise to practice the skill 3-4 times a week.</li> <li>• You will continue to fill in the daily measures looking at psychological distress, pain, fatigue, mindfulness and value driven behaviour through the ACT intervention phase.</li> </ul>
<p><u>After the ACT intervention</u> Duration of this phase: 4 weeks follow-up period</p>	<ul style="list-style-type: none"> <li>• At the end of the six weeks ACT intervention period, you will complete the same two questionnaires that you completed at the start of the study and the ACT questionnaire (these questionnaires should take no longer than 15-20 minutes to complete).</li> <li>• You will continue to fill in the daily measures for the four weeks following the end of the ACT intervention.</li> <li>• At the end of the four weeks follow-up period, you will be asked to complete the same two questionnaires that you completed at the start</li> </ul>

	of the study a final time and the ACT questionnaire (these questionnaires should take no longer than 15-20 minutes to complete).
--	--

Once you have completed the final set of questionnaires, you will be entered into a prize draw to receive one of two £50 Amazon vouchers.

After reading this information sheet, you will have the opportunity to speak to Hannah Cox, the Chief Investigator of the study, to check that you are eligible to take part and to receive answers to your questions. You will then be sent an electronic version of this information sheet and a consent form on Qualtrics to electronically sign using your computer mouse. You will have up to one week to consider whether to take part or not. Your contact details will not be shared with anyone outside of the research team.

After starting the study, you will be informed how long you have to wait before accessing the ACT intervention (i.e. one to three weeks). Once you have started the ACT intervention, you will be sent an e-mail every week as a reminder to complete the next module. Hannah Cox will also be available to support you over the phone and will contact you before starting the ACT intervention, mid-way through and at the end of the ACT intervention as minimum. She will get in touch via e-mail to arrange a suitable time for a brief telephone call (maximum 10 minutes) to check how you are progressing with the intervention, discuss any challenges, and answer your questions. On the last call you will also have the chance to provide some formal feedback on the intervention received (maximum 20 minutes).

Hannah and the research team will be also available to answer any questions or concerns throughout your participation. Please see contact details at the end of this Participant Information Sheet.

You will not be required to have additional tests or receive extra drugs or medicines.

### **What are the possible disadvantages and risks of taking part?**

There are no risks to your health and your treatment will not be affected whether or not you agree to take part in this study. It is possible that some of the questions could be upsetting; however in our experience of developing such questionnaires for people with other conditions we have found this rarely happens. In the event that the questionnaires do cause upset and you require support, we advise that you contact the team involved in your care and/or your GP.

If you have any queries or concerns, please contact Hannah Cox, or another member of the research team, using the contact details provided at the end of the information sheet. If any of your responses lead us to believe that there may be a significant risk of harm to you or someone else, we will signpost you to your primary care team and contact your GP, but we will endeavour to inform you first.

### **What are the possible benefits of taking part?**

We hope that taking part in the intervention will help you by gaining a greater insight into any difficulties you may be experiencing in relation to your cancer diagnosis and will support you in finding new ways to cope with them. However, this cannot be guaranteed. Taking part may also encourage some individuals to start conversations with their care team about any difficulties they may be experiencing related to their cancer. The information from this study is likely to help us better understand how people with cancer can

be supported. Upon completing the study you will be entered into a prize draw to receive a £50 Amazon voucher.

### **What happens when the research study stops?**

If you are the winner of a £50 Amazon voucher, we will be in touch with you via email or telephone. We will also be happy to provide you with a summary of the study's main findings if you wish.

### **What if something goes wrong?**

It is very unlikely that anything will go wrong. However, if you have any concerns about any aspect of the study, you can contact Dr Michelle Taylor or Dr Jessica Kingston, who are co- investigators on this project (contact information below).

### **Will my taking part in this study be kept confidential?**

All information which is collected about you during the course of the research will be kept strictly confidential and stored in accordance with General Data Protection for Research (GDPR) and Data Protection Act 2018. Only the researchers will have access to the questionnaires you complete and in the study you will be known only by a numerical ID number. Any information about you will be stored separately from your signed consent form, and your name and address, so that you cannot be recognised from it.

With your agreement, your GP will be informed of your participation and given an information sheet about the study but will not have access to the responses you write in the questionnaires.

If a participant loses capacity to consent whilst taking part in the study, no new data will be collected but the data already collected will be kept. All data will be stored until 6 months after publication of the research or 5 years, whichever is the greater.

There is a possibility that the study will be audited by independent bodies, to verify that the research has been carried out in lines with the GDPR and Data Protection Act 2018. They may have access to the consent forms and data collected as part of the study.

### **What will happen to the results of the research study?**

It is anticipated that the results of this study will be published in a national or international journal. All the information we collect will be anonymised and you will not be identified in any report or publication.

### **Who is organising and funding the research?**

This research study is funded by Royal Holloway, University of London. The study is being carried out by Hannah Cox, a Trainee Clinical Psychologist, as part fulfilment of her doctorate in clinical psychology. The project has been organised in collaboration with Dr Michelle Taylor (Clinical Psychologist and Researcher, Health Psychology Research Ltd.) and Dr Jess Kingston (Senior Lecturer in Clinical Psychology Royal Holloway, University of London).

### **Who has reviewed the study?**

All research is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and approved by the Ethics Committee at Royal Holloway, University of London.

### **How will my data be used?**

Royal Holloway, University of London (RHUL) is the sponsor for this study based in the United Kingdom. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. RHUL will keep identifiable information about you for up to 6 months after the study has finished.

Data collected may be shared in an anonymised form to allow reuse by the research team and other third parties. Anonymised data will ensure that individuals are not identifiable.

You can find out more about how we use your information by contacting Hannah Cox.

RHUL will collect information from you for this research study in accordance with our instructions.

RHUL will use your name and contact details to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Individuals from RHUL and regulatory organisations may look at your research records to check the accuracy of the research study.

The only people in RHUL who will have access to information that identifies you will be people who need to contact you to enable you to take part in the study or audit the data collection process. The people who analyse the information will not be able to identify you and will not be able to find out your name or contact details.

RHUL will collect information about you for this research study. This information will include your name and contact details, and health information, which is regarded as a special category of information. We will use this information to contact you about the research study and to obtain information about your health as outlined in the participant information sheet.

You can withdraw from the study at any point, without giving reason. If you choose to withdraw you would be asked which type of withdrawal you would prefer – you can choose between leaving the study and allowing the information already given to be used by the research team or leaving the study and asking for the information already given by you to be destroyed. If you withdraw from the study it will not affect your care in any way.

### **Contacts for Further Information**

Hannah Cox

E-mail: **Hannah.cox.2019@live.rhul.ac.uk**

Address: Department of Clinical Psychology, Royal Holloway, University of London, Egham Hill, Egham, Surrey, TW20 0EX

Or, alternatively you may wish to contact:

Dr Michelle Taylor

E-mail: **michelle.taylor@rhul.ac.uk**

Dr Jessica Kingston  
E-mail: [jessica.kingston@rhul.ac.uk](mailto:jessica.kingston@rhul.ac.uk)

You can also contact a member of your care team if you would like to discuss the study or would like advice about whether to participate.

**Thank you for reading this.**

**We hope you agree to take part in this study and get in touch with Hannah via email: [hannah.cox.2019@live.rhul.ac.uk](mailto:hannah.cox.2019@live.rhul.ac.uk) or on 07940808336.**

**You will be sent an electronic copy of this information sheet and a signed consent form to keep for reference and in case you wish to contact us with any queries.**



## Appendix D

### Consent Form



### Consent Form

**Title of Project:** Development and pilot testing of an online ACT intervention for improving psychological outcomes and quality of life for adults with cancer.

**Researchers:** Miss Hannah Cox, Dr Michelle Taylor & Dr Jessica Kingston.

**Please initial box:**

1. I confirm that I have read and understand the Participant Information Sheet for the above study.
2. I confirm that I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
3. I understand that my participation is voluntary and that I am free to withdraw from the study at any time, without giving any reason, without my medical care or legal rights being affected.
4. I understand that I will be participating in a study for 11, 12 or 13 weeks and that I will have to wait 1, 2 or 3 weeks before accessing the ACT intervention.
5. I understand that I will be asked to complete two questionnaires (each taking 5-10 minutes) about my levels of anxiety and depression and quality of life at four points in time: upon signing up for the study, before starting the ACT intervention, at the end of the ACT intervention, and 4 weeks after completing the ACT intervention.
6. I understand that taking part in the ACT intervention will involve logging into the intervention programme every week and completing brief exercises via Qualtrics (a secure computer programme), for a total period of six weeks. I understand that I will be asked to complete an ACT-specific questionnaire (taking approximately 5-10 minutes) at three points in time: before starting the ACT intervention, at the end of the intervention and at 4 weeks follow-up.
7. I agree to logging into the programme daily to complete short scales looking at mood, symptoms, treatment side effects, pain levels, fatigue, mindfulness and value based behaviour for the entire duration of the study (11-13 weeks).

8. I agree to receive weekly e-mail reminders to remind me to access the ACT intervention module.
9. I agree to be added to a prize draw to receive a £50 Amazon voucher upon completion of the study (i.e. at the end of the four week period after finishing the ACT intervention).
10. After having reviewed the Participant Information sheet, I agree to take part in the study.
11. I agree for Hannah Cox, Chief Investigator, to contact me over the phone on three occasions: prior to the start, mid-way and at the end of the ACT intervention to monitor my progress and ask for my feedback.
12. I would like to receive feedback on the results and findings of the study via email once the research has concluded.
13. I agree to my healthcare team and my GP being informed of my participation in this study.

Please provide details below to enable us to write to your GP and your consultant.

Date of Birth: ...../...../.....

Your address:

.....  
.....

GP name and address:

.....  
.....

Consultant name and address:

.....  
.....

*This Consent Form will be stored separately from the responses you provide.*

*An original copy of the participant information sheet and completed informed consent form will be sent to you via e-mail for your reference, in addition to the copy filed in the researcher's file*

.....	.....	.....
Name of Patient	Date	Signature

.....	.....	.....
Researcher	Date	Signature

## Appendix E

### Socio-demographic Questionnaire

#### Demographic and Clinical Information Sheet

Please fill in the below information.

Date of birth

☐ Q90

Are you:

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Other
- ☐ Prefer not to say

Q91

Marital status

Married/Civil partnership

Q94

Were you born in the UK?

- ☐ Yes
- ☐ No

Q95

 Display this question

If Were you born in the UK? No Is Selected

How long have you lived in the UK for?

Years

Months

☐ Q93

Please indicate your ethnic origin below:

White - British

Q96

Do you follow a religion?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Q97

 Display this question

If Do you follow a religion? Yes Is Selected

What religion do you follow?

Q105



Please indicate your current or most recent occupation below:

Q106



When were you first diagnosed with cancer?

(mm/yy)

Q107



What type of cancer were you diagnosed with? (e.g. lung cancer)

Q108

What stage of cancer were you diagnosed with?

- ☐ Stage I
- ☐ Stage II
- ☐ Stage III
- ☐ Stage IV
- ☐ Other

▼ Display this question

If Please indicate your employment status Not working Is Selected

Not working:

- ☐ Due to cancer
- ☐ Due to other health problem
- ☐ Because cannot find work
- ☐ By choice
- ☐ Due to another reason

Q104

▼ Display this question

If Please indicate your employment status Retired Is Selected

Retired:

- ☐ Early due to cancer
- ☐ Early due to other health problem
- ☐ Early by choice
- ☐ Early due to another reason
- ☐ At the usual retirement age for my work

Q103



▼ Display this question

If Working part time: Due to another reason Is Selected

Or Not working: Due to another reason Is Selected

Or Retired: Early due to another reason Is Selected

Please state the reason

▼  Display this question

If What stage of cancer were you diagnosed with? Other Is Selected

Please specify the stage of cancer you were diagnosed with?

Q110

Is the cancer currently in 'remission'?

- ☐ Yes  
☐ No

☐ Q111

Do you have any health problems or complications which are due to cancer or its treatment?

- ☐ Yes  
☐ No

Q112



▼  Display this question

If Do you have any health problems or complications which are due to cancer or its treatment? Yes Is Selected

Please sate any health problems or complications due to cancer or it's treatment

Are you in full time education?

- ☐ yes  
☐ no

Q99



What is the highest level of education you have achieved? (e.g. undergraduate degree)

Q100

Please indicate your employment status

- ☐ Working full time  
☐ Working part time  
☐ Not working  
☐ Retired

☐ Q101

...

▼  Display this question

If Please indicate your employment status Working part time Is Selected

Working part time:

- ☐ Due to cancer  
☐ Due to other health problem  
☐ Because cannot find full-time work  
☐ By choice  
☐ Due to another reason

Q130



Display this question

If Are you currently taking any medication to do with your mental health? Yes Is Selected

Please specify the type of medication you are currently taking:

Q120

Have you ever received any psychological support? e.g. cognitive behavioural therapy or counselling

- ☐ Yes
- ☐ No

Q123

Display this question

If Have you ever received any psychological support? e.g. cognitive behavioural therapy or counselling Yes Is Selected

Was the psychological support

- ☐ sought in relation to being diagnosed with cancer
- ☐ sought for reasons unrelated to being diagnosed with cancer
- ☐ sought for a number of reasons, including being diagnosed with cancer
- ☐ sought for reasons I would prefer not to say

Q128



Display this question

If Have you ever been diagnosed with a mental health problem? Yes Is Selected

Please specify the type of mental health problem in the space below:

Q125

Display this question

If Have you ever received any psychological support? e.g. cognitive behavioural therapy or counselling Yes Is Selected

Are you currently still receiving this psychological support?

- ☐ Yes
- ☐ No

Q124



Display this question

If Have you ever received any psychological support? e.g. cognitive behavioural therapy or counselling Yes Is Selected

In the space below could you please tell us a bit about the type of psychological support you have received? e.g. type of support and duration

Q129

Are you currently taking any medication to do with your mental health?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Have you ever used an online mental health app? e.g. headspace

- ☐ No
- ☐ Yes

Q121

▼  Display this question

If Have you ever used an online mental health app? e.g. headspace Yes Is Selected

Are you currently using this app?

- ☐ Yes
- ☐ No

Q122



▼  Display this question

If Are you currently using this app? No Is Selected

Could you please indicate when you last used the app in the space below

Q131



▼  Display this question

If Are you currently using this app? Yes Is Selected

In the space below could you please tell us the name of the app that you are currently using

## Appendix F

### Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.  
Don't take too long over you replies: your immediate is best.

D	A		D	A	
		<b>I feel tense or 'wound up':</b>			<b>I feel as if I am slowed down:</b>
	3	Most of the time		3	Nearly all the time
	2	A lot of the time		2	Very often
	1	From time to time, occasionally		1	Sometimes
	0	Not at all		0	Not at all
		<b>I still enjoy the things I used to enjoy:</b>			<b>I get a sort of frightened feeling like 'butterflies' in the stomach:</b>
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		<b>I get a sort of frightened feeling as if something awful is about to happen:</b>			<b>I have lost interest in my appearance:</b>
	3	Very definitely and quite badly		3	Definitely
	2	Yes, but not too badly		2	I don't take as much care as I should
	1	A little, but it doesn't worry me		1	I may not take quite as much care
	0	Not at all		0	I take just as much care as ever
		<b>I can laugh and see the funny side of things:</b>			<b>I feel restless as I have to be on the move:</b>
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		<b>Worrying thoughts go through my mind:</b>			<b>I look forward with enjoyment to things:</b>
	3	A great deal of the time		0	As much as I ever did
	2	A lot of the time		1	Rather less than I used to
	1	From time to time, but not too often		2	Definitely less than I used to
	0	Only occasionally		3	Hardly at all
		<b>I feel cheerful:</b>			<b>I get sudden feelings of panic:</b>
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		<b>I can sit at ease and feel relaxed:</b>			<b>I can enjoy a good book or radio or TV program:</b>
	0	Definitely		0	Often
	1	Usually		1	Sometimes
	2	Not Often		2	Not often
	3	Not at all		3	Very seldom



## Appendix G

### Multidimensional Psychological Flexibility Inventory (MPFI)

<b>FLEXIBILITY SUBSCALES</b>						
<b>ACCEPTANCE</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
I was receptive to observing unpleasant thoughts and feelings without interfering with them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried to make peace with my negative thoughts and feelings rather than resisting them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I made room to fully experience negative thoughts and emotions, breathing them in rather than pushing them away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I had an upsetting thought or emotion, I tried to give it space rather than ignoring it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I opened myself to all of my feelings, the good and the bad.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>PRESENT MOMENT AWARENESS</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
I was attentive and aware of my emotions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was in tune with my thoughts and feelings from moment to moment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I paid close attention to what I was thinking and feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was in touch with the ebb and flow of my thoughts and feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I strived to remain mindful and aware of my own thoughts and emotions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>SELF AS CONTEXT</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
Even when I felt hurt or upset, I tried to maintain a broader perspective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I carried myself through tough moments by seeing my life from a larger viewpoint.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried to keep perspective even when life knocked me down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I was scared or afraid, I still tried to see the larger picture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When something painful happened, I tried to take a balanced view of the situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>DEFUSION</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
I was able to let negative feelings come and go without getting caught up in them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I was upset, I was able to let those negative feelings pass through me without clinging to them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I was scared or afraid, I was able to gently experience those feelings, allowing them to pass.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was able to step back and notice negative thoughts and feelings without reacting to them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In tough situations, I was able to notice my thoughts and feelings without getting overwhelmed by them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



<b>VALUES</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
I was very in-touch with what is important to me and my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I stuck to my deeper priorities in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried to connect with what is truly important to me on a daily basis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Even when it meant making tough choices, I still tried to prioritize the things that were important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My deeper values consistently gave direction to my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>COMMITTED ACTION</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
Even when I stumbled in my efforts, I didn't quit working toward what is important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Even when times got tough, I was still able to take steps toward what I value in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Even when life got stressful and hectic, I still worked toward things that were important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I didn't let setbacks slow me down in taking action toward what I really want in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I didn't let my own fears and doubts get in the way of taking action toward my goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>INFLEXIBILITY SUBSCALES</b>						
<b>EXPERIENTIAL AVOIDANCE</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
When I had a bad memory, I tried to distract myself to make it go away	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried to distract myself when I felt unpleasant emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When unpleasant memories came to me, I tried to put them out of my mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When something upsetting came up, I tried very hard to stop thinking about it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If there was something I didn't want to think about, I would try many things to get it out of my mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>LACK OF CONTACT WITH THE PRESENT MOMENT</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
I did most things on "automatic" with little awareness of what I was doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did most things mindlessly without paying much attention.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I went through most days on <u>auto-pilot</u> without paying much attention to what I was thinking or feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I floated through most days without paying much attention.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of the time I was just going through the motions without paying much attention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



<b>SELF AS CONTENT</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
I thought some of my emotions were bad or inappropriate and I shouldn't feel them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I criticized myself for having irrational or inappropriate emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believed some of my thoughts are abnormal or bad and I shouldn't think that way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I told myself that I shouldn't be feeling the way I'm feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I told myself I shouldn't be thinking the way I was thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>FUSION</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
Negative thoughts and feelings tended to stick with me for a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distressing thoughts tended to spin around in my mind like a broken record.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was very easy to get trapped into unwanted thoughts and feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I had negative thoughts or feelings it was very hard to see past them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When something bad <u>happened</u> it was hard for me to stop thinking about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>LACK OF CONTACT WITH VALUES</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
My priorities and values often fell by the wayside in my day to day life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When life got hectic, I often lost touch with the things I value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The things that I value the most often fell off my priority list completely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I didn't usually have time to focus on the things that are really important to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When times <u>got</u> tough, it was easy to forget about what I truly value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>INACTION</b>						
<b>IN THE LAST TWO WEEKS...</b>	<b>Never TRUE</b>	<b>Rarely TRUE</b>	<b>Occasionally TRUE</b>	<b>Often TRUE</b>	<b>Very Often TRUE</b>	<b>Always TRUE</b>
Negative feelings often trapped me in inaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative feelings easily stalled out my plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting upset left me stuck and inactive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative experiences derailed me from what's really important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unpleasant thoughts and feelings easily overwhelmed my efforts to deepen my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix H

### The Cancer Dependent Quality of Life (CancerDQoL)

## CancerDQoL

This questionnaire asks about your quality of life – in other words how good or bad you feel your life to be.

Please put an “X” in the box that best indicates your response for each item.

What we would like to know is how you feel about your life now.

<b>I) In general, my present quality of life is:</b>						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
excellent	very good	good	neither good nor bad	bad	very bad	extremely bad

Now we would like to know how your quality of life is affected by your experience of cancer. Please consider what your quality of life would be like without cancer i.e. without the experience of:

- cancer
- cancer-related treatment
- any side effects

<b>II) Without cancer, my quality of life would be:</b>				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
very much better	much better	a little better	the same	worse

**The following items are about different aspects of your life. Each item is divided into two parts:**

<p>In Part (a) please show how your experience of cancer <u>affects</u> this aspect of your life</p> <p>In Part (b) please show how <u>important</u> this aspect is to your quality of life.</p>
--

1 (a)	<b>Without cancer, I would enjoy my leisure activities:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> very much more      much more      a little more      the same      less
(b)	<b>My leisure activities are:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> very important      important      somewhat important      not at all important

2	<b>Are you currently working (paid or voluntary work)?</b> Yes <input type="checkbox"/> No <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). <b>If no, would you like to work?</b> Yes <input type="checkbox"/> No <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). If <b>no</b> to <u>both</u> questions, go straight to 3.
(a)	<b>Without cancer, my working life would be:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> very much better      much better      a little better      the same      worse
(b)	<b>For me, having a working life is:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> very important      important      somewhat important      not at all important

3	<b>Do you ever go on holiday?</b> Yes <input type="checkbox"/> No <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). <b>If no, would you like to go on holiday?</b> Yes <input type="checkbox"/> No <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). If <b>no</b> to <u>both</u> questions, go straight to 4a.
(a)	<b>Without cancer, my holidays would be:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> very much better      much better      a little better      the same      worse
(b)	<b>For me, holidays are:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> very important      important      somewhat important      not at all important

4	(a) Without cancer, physically I could do:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much more	much more	a little more	the same	less
(b)	For me, how much I can do physically is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

5	Do you have any family / relatives?					
	Yes <input type="checkbox"/> If <b>yes</b> , complete (a) and (b).					
	No <input type="checkbox"/> If <b>no</b> , go straight to 6a.					
(a)	Without cancer, my family life would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My family life is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

6	(a) Without cancer, my friendships and social life would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My friendships and social life are:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

7	Do you have or would you like to have a close personal relationship (e.g. husband / wife, partner)?					
	Yes <input type="checkbox"/> If <b>yes</b> , complete (a) and (b).					
	No <input type="checkbox"/> If <b>no</b> , go straight to 8.					
(a)	Without cancer, my closest personal relationship would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	For me, having a close personal relationship is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	



<b>8</b>	<b>Do you have or would you like to have a sex life?</b> <b>Yes</b> <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). <b>No</b> <input type="checkbox"/> If <b>no</b> , go straight to 9a.
<b>(a)</b>	<b>Without cancer, my sex life would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better         <input type="checkbox"/> much better         <input type="checkbox"/> a little better         <input type="checkbox"/> the same         <input type="checkbox"/> worse       </div>
<b>(b)</b>	<b>For me, having a sex life is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important         <input type="checkbox"/> important         <input type="checkbox"/> somewhat important         <input type="checkbox"/> not at all important       </div>

<b>9 (a)</b>	<b>Without cancer, my physical appearance would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better         <input type="checkbox"/> much better         <input type="checkbox"/> a little better         <input type="checkbox"/> the same         <input type="checkbox"/> worse       </div>
<b>(b)</b>	<b>For me, my physical appearance is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important         <input type="checkbox"/> important         <input type="checkbox"/> somewhat important         <input type="checkbox"/> not at all important       </div>

<b>10 (a)</b>	<b>Without cancer, my self-confidence would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better         <input type="checkbox"/> much better         <input type="checkbox"/> a little better         <input type="checkbox"/> the same         <input type="checkbox"/> worse       </div>
<b>(b)</b>	<b>My self-confidence is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important         <input type="checkbox"/> important         <input type="checkbox"/> somewhat important         <input type="checkbox"/> not at all important       </div>

<b>11 (a)</b>	<b>Without cancer, my motivation to do things would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better         <input type="checkbox"/> much better         <input type="checkbox"/> a little better         <input type="checkbox"/> the same         <input type="checkbox"/> worse       </div>
<b>(b)</b>	<b>My motivation to do things is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important         <input type="checkbox"/> important         <input type="checkbox"/> somewhat important         <input type="checkbox"/> not at all important       </div>

<b>12 (a)</b>	<b>Without cancer, my feelings about the future (e.g. worries, hopes) would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better         <input type="checkbox"/> much better         <input type="checkbox"/> a little better         <input type="checkbox"/> the same         <input type="checkbox"/> worse       </div>
<b>(b)</b>	<b>My feelings about the future are:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important         <input type="checkbox"/> important         <input type="checkbox"/> somewhat important         <input type="checkbox"/> not at all important       </div>

<b>13 (a)</b>	<b>Without cancer, my financial situation would be:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
<b>(b)</b>	<b>My financial situation is:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

<b>14 (a)</b>	<b>Without cancer, I would be able to do th Zoom myself:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much more	much more	a little more	the same	less
<b>(b)</b>	<b>My ability to do things for myself is:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

<b>15 (a)</b>	<b>Without cancer, I would enjoy food and drink:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much more	much more	a little more	the same	less
<b>(b)</b>	<b>My enjoyment of food and drink is:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

<b>16 (a)</b>	<b>Without cancer, my freedom to eat and / or drink as I wish would be:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much greater	much greater	a little greater	the same	less
<b>(b)</b>	<b>My freedom to eat and / or drink as I wish is:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

<b>17</b>	<b>Is there a spiritual or religious aspect to your life?</b>					
	Yes <input type="checkbox"/> If <b>yes</b> , complete (a) and (b).					
	No <input type="checkbox"/> If <b>no</b> , go straight to 18.					
<b>(a)</b>	<b>Without cancer, my spiritual or religious life would be:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
<b>(b)</b>	<b>My spiritual or religious life is:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	



<b>18</b>	<b>Are there times when you wish people did not fuss or worry about you?</b> <b>Yes</b> <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). <b>No</b> <input type="checkbox"/> If <b>no</b> , go straight to 19a.
<b>(a)</b>	<b>Without cancer, people would fuss or worry about me:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very much less       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          much less       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          a little less       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          the same       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          more       </div>
<b>(b)</b>	<b>For me, not having others fuss or worry about me is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          somewhat important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          not at all important       </div>

<b>19 (a)</b>	<b>Without cancer, the way people in general react to me would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very much better       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          much better       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          a little better       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          the same       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          worse       </div>
<b>(b)</b>	<b>The way people in general react to me is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          somewhat important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          not at all important       </div>

<b>20 (a)</b>	<b>Without cancer, getting out and about (e.g. shopping, short trips) would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very much easier       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          much easier       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          a little easier       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          the same       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          more difficult       </div>
<b>(b)</b>	<b>For me, getting out and about is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          somewhat important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          not at all important       </div>

<b>21 (a)</b>	<b>Without cancer, the time it takes me to do things would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very much less       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          much less       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          a little less       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          the same       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          more       </div>
<b>(b)</b>	<b>The time it takes me to do things is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          somewhat important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          not at all important       </div>

<b>22</b>	<b>Would you like to have children (or more children)?</b> <b>Yes</b> <input type="checkbox"/> If <b>yes</b> , complete (a) and (b). <b>No</b> <input type="checkbox"/> If <b>no</b> , go straight to 23a.
<b>(a)</b>	<b>Without cancer, my hopes of having children, or more children, would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very much greater       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          much greater       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          a little greater       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          the same       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          less       </div>
<b>(b)</b>	<b>For me, having children is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          somewhat important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          not at all important       </div>

<b>23 (a)</b>	<b>Without cancer, my ability to think clearly, concentrate and / or remember things would be:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very much better       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          much better       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          a little better       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          the same       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          worse       </div>
<b>(b)</b>	<b>For me, my ability to think / concentrate / remember is:</b> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          very important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          somewhat important       </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>          not at all important       </div>

**24** If there are any other ways in which your experience of cancer, cancer-related treatment and any side effects affect your quality of life, please say what they are below.

**Finally, please turn to the next page and respond to the items about your health.**

i	<b>In general, my health is:</b> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"><input type="checkbox"/> excellent</div> <div style="text-align: center;"><input type="checkbox"/> very good</div> <div style="text-align: center;"><input type="checkbox"/> good</div> <div style="text-align: center;"><input type="checkbox"/> neither good nor bad</div> <div style="text-align: center;"><input type="checkbox"/> bad</div> <div style="text-align: center;"><input type="checkbox"/> very bad</div> <div style="text-align: center;"><input type="checkbox"/> extremely bad</div> </div>
ii	<b>Without cancer, my health would be:</b> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"><input type="checkbox"/> very much better</div> <div style="text-align: center;"><input type="checkbox"/> much better</div> <div style="text-align: center;"><input type="checkbox"/> a little better</div> <div style="text-align: center;"><input type="checkbox"/> the same</div> <div style="text-align: center;"><input type="checkbox"/> worse</div> </div>
	<b>For me, my health is:</b> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"><input type="checkbox"/> very important</div> <div style="text-align: center;"><input type="checkbox"/> important</div> <div style="text-align: center;"><input type="checkbox"/> somewhat important</div> <div style="text-align: center;"><input type="checkbox"/> not at all important</div> </div>

**Thank you for completing this questionnaire.**

## Appendix I

### Idiographic Measures

Please rate how upset and/or downhearted you were today overall:

Not at all                      A little                      Somewhat                      Very much so  
0                                      1                                      2                                      3

Slide the bar to indicate

Please rate how anxious and/or worried you were today overall:

Not at all                      A little                      Somewhat                      Very much so  
0                                      1                                      2                                      3

Slide the bar to indicate

For the statements below we are interested to know how 'bothered' you have been.  
(i.e. the impact on your daily life)

Please rate how much you agree with the following statements:

Over the past 24 hours I have been bothered by pain related to cancer and it's treatment

Not at all                      A little                      Somewhat                      Very much so  
0                                      1                                      2                                      3

Slide bar to indicate

Not at all	A little	Somewhat	Very much so
0	1	2	3

0

Not at all	A little	Somewhat	Very much so
0	1	2	3



## Appendix J

### Feedback Questions

☐ Q2

...

We would like to get your feedback on the acceptability and feasibility of the online ACT programme you have completed.

Q3



Please rate how much you agree with the statements below:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
The information on the online ACT programme was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information on the ACT programme was clear in meaning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information on the online ACT programme was informative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information on the online ACT intervention was relevant to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online ACT programme was user friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online ACT programme was easy to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4

We would like to hear about how you experienced the **online format** of the intervention.

Q5



1. What was most helpful about it?

Q6



2. What was least helpful about it?

Q7

Please help us improve the program by answering some questions about the content of the intervention you received. We are interested in your honest opinion, whether it is positive or negative. Please answer all of the questions below.

We very much welcome your comments and suggestions.

Q8

How would you rate the quality of services you received?

- ☐ Excellent
- ☐ Good
- ☐ Fair
- ☐ Poor

Q9

Did you get the kind of services you wanted?

- ☐ No, definitely not
- ☐ No, not really
- ☐ Yes, generally
- ☐ Yes, definitely

Q10

To what extent has our program met your needs?

- ☐ Almost all of my needs have been met
- ☐ Most of my needs have been met
- ☐ Only a few of my needs have been met
- ☐ None of my needs have been met

Q11

If a friend were in need of similar help, would you recommend our program to them?

- ☐ No, definitely not
- ☐ No, not really
- ☐ Yes, generally
- ☐ Yes, definitely

Q12

How satisfied are you with the amount of help you have received?

- ☐ Quite dissatisfied
- ☐ Indifferent or mildly dissatisfied
- ☐ Mostly satisfied
- ☐ Very satisfied

Q13

Have the services you received helped you deal more effectively with your problems?

- ☐ Yes, they helped a great deal
- ☐ Yes, they helped somewhat
- ☐ No, they really did not help
- ☐ No, they seemed to make things worse

Q14

In an overall, general sense, how satisfied are you with the service you have received?

- ☐ Very satisfied
- ☐ Mostly satisfied
- ☐ Indifferent or mildly dissatisfied
- ☐ Quite dissatisfied

Q15

If you were to seek help again, would you come back to our program?

- ☐ No, definitely not
- ☐ No, not really
- ☐ Yes, generally
- ☐ Yes, definitely

Q16



Is there anything else you would like to tell us about how you found the intervention?

Q18



Please use the space below to share any ways in which the intervention could be improved:

Q17



Thank you very much for taking the time to answer these questions.



## Appendix K

### Screening Question

The National Comprehensive Cancer Network (NCCN) Distress Thermometer (DT) (Bulll et al., 2008)

Please select the number (0 - 10) that best describes how much distress you have been experiencing in the past week including today.

	No distress					Extreme distress					
	0	1	2	3	4	5	6	7	8	9	10
Distress											

## Appendix L

### Web-based ACT Intervention Protocol

#### Introduction

Welcome and thank you for agreeing to take part in our study!

Before we begin, below are some general instructions to help you get the most out of this programme:

Please put some time aside each week (approximately 30-40 minutes) to complete the module for that week. We would advise choosing a time and a place where there aren't any distractions and you are unlikely to be disturbed.

Please complete one module per week. To get the most out of this program, we also encourage you to practice the skills in everyday life. We will send you a weekly message reminding you to log on and access the module. You will also receive reminders to complete the daily rating scales.

We know that talking about cancer, health and emotional wellbeing can be upsetting. If you do find that you are struggling to manage your feelings at any point during the programme, please get in touch with a member of the research team on 07940808336 or contact Hannah Cox (e-mail: Hannah.Cox.2019@live.rhul.ac.uk). We would also encourage you to speak with your care team at Maggie's and/or your GP for further support.

Please press 'next'

#### Questionnaires

Before we get started, here are some questionnaires for you to complete.

Please take your time to read the instructions at the top of the page and when going through each of the questions.

*Questionnaires here*

Please press 'next' to begin the intervention

#### Module 1

##### Introduction to ACT and Mindfulness-based Skills

#### Living with cancer

Being diagnosed with cancer and having cancer treatment can affect your health, wellbeing and quality of life, even once treatment has finished. You may find you have struggled with some of the following:

- Adjusting to the diagnosis of cancer and the health changes you've experienced
- Feeling worried, hopeless or uncertain about the future.
- The short and long-term side effects of cancer or its treatment
- Changes in your relationships with others

- Returning to work and/or other daily activities
- Having less freedom to do the things you previously enjoyed
- Changes to your diet or your enjoyment of meals
- Changes to your physical appearance
- A loss of confidence or motivation

A cancer diagnosis can be a major life-changing event. Not surprisingly people living with cancer can experience a range of different emotions. Common emotions include, but are not limited to, low mood, disbelief, anxiety, frustration, anger or hopelessness. These emotions may differ on a daily, hourly or even on a minute-by-minute basis. There is no right or wrong way to feel.

It is very normal to try to get rid of these difficult feelings, perhaps by attempting to control them or not think about them or push them away. This can actually make it harder for us in the long run. People often find that in trying to get rid of difficult thoughts and feelings, they stop doing things that are really important to them.

For example, after a bad day we might feel less motivated to eat healthily, spend time with loved ones, or to look after ourselves. Cancer, and adjusting to cancer, can affect all aspects of life. We hope that by participating in this study you will learn more about your own internal experiences and reactions (thoughts, emotions, behaviours, physical sensations) to living with cancer. Additionally, we hope that by completing the modules you will feel better equipped to manage and respond to difficult thoughts and emotions that may arise so that you can continue to manage life and the daily struggles that come with it to the best of your abilities.

The best way to get the most out of this programme is to participate in every aspect of it.

Please press next

### **What is Acceptance and Commitment Therapy (ACT)?**

ACT is a psychological therapy that has been found to be helpful for many people with physical health conditions, including people living with cancer.

ACT proposes that human suffering is universal. To be human is to experience psychological pain in the form of difficult thoughts, feelings and experiences. This pain can hold you back from living the kind of life you would like to be living. Often we can attach ourselves to this pain and start to judge our lives based on how we feel rather than what we do.

ACT involves allowing yourself to have your difficult thoughts and feelings, rather than being at war with them, and committing to a life that is deeply meaningful to you as an individual.

Here is a way of bringing this idea to life:

Please click on the link below to access the “Passengers on a bus” audio.

[Downloadable link of audio/script]

(Script adapted from ‘Get Out of Your Mind and Into Your Life: The New Acceptance and Commitment Therapy’ (Hayes & Smith, 2005)

*Imagine that you’re the driver of a bus called “your life.” Like any bus, as you drive along, you pick up a range of passengers. We can think of these as your life experiences - thoughts, feelings, memories etc. Some of*

*these passengers are like old friends who you welcome with open arms (happy memories, happy thoughts). But there will also be ones you don't like very much – such as difficult memories or critical thoughts. Some passengers you may have picked up many years ago and others might have joined you more recently.*

*Sometimes in life, it may feel as if you are investing a lot of time in trying to get rid of those passengers that you really don't like. Perhaps you find yourself spending a lot of time arguing with difficult passengers, hoping that if you can get those bullies to slouch down in their seats at the back you won't have to see them so often. Perhaps you try to conjure up nicer passengers to come to the front of the bus to try to block out the nastier ones, but however much you try, they still shout and jeer. Or perhaps you cut the difficult experiences a deal – telling them that if they will be quiet you promise you'll not go in certain directions. For example, perhaps you've been tempted to veer towards the 'Dreams Road' or 'New Experiences Avenue', but the bullies get loud and threatening, so you calm them by heading back to 'Same Old Route'.*

*Other times you may have stopped the bus altogether and demanded that they leave. But all the time your bus is parked up and you're at war with your difficult passengers, your bus is headed nowhere.*

*Maybe sometimes it feels like your life has completely been taken over by difficult passengers and you're just not headed in the direction that you had hoped for in life.*

*But here is one really important thing. This is your bus. Only you have the keys. As loud as these passengers can be when you take a different turn, when you head somewhere new and unknown, **you** are the one deciding where to go and they can't actually hurt you. They can scream in your ear and stomp their feet, making you feel very uncomfortable, but you can keep driving.*

*You accept that in order to take this bus – your life – in directions that are important and meaningful to you, you will have some unwelcome passengers coming along for the ride.*

*Please Press 'Next'*

## **How can ACT help?**

This ACT programme will support you in getting back into the driver seat of your life. We know the passengers will still be there, and some will be loud and boisterous at times, but we will practice allowing your passengers to be there and to still drive in the direction that's important to you.

To do so, over the next weeks, we will help you:

- 1 Deal with your passengers in a different way, using “Mindfulness-based” skills
- 2 Decide the directions you want your bus of life to go in - we call this “Valued living” skills

We have made some basic assumptions when designing this programme. These assumptions are:

1. Psychological suffering is a part of our human experience.
2. Being diagnosed and living with cancer, and its treatment, can cause painful and difficult experiences.
3. You are accessing this programme because you are ready to make changes in order to decrease the negative impact of cancer on your life and do more of the things that matter most to you.

## **Mindfulness-based skill 1 – present moment focus**

We have seen how easy it is to get distracted by the passengers on our bus of life and how this can disrupt our ride, making us loosen the grip on the stirring wheel and to lose focus on the road we are on. When we

are caught up in a battle with our unwanted passengers, we are typically caught up in the past or future and very seldom are we focused on the here and now.

The first mindfulness-based skill that we are going to develop is to start training your attention to be in the present moment, right here and now. This involves being aware of all your passengers (thoughts, feelings, behavioural reactions, and physical sensations), even unpleasant ones, and letting these be in our awareness without holding on to them or struggling against them.

The best way to grasp this mindfulness skill is to do it!

Please click on the link below to access the 5-minute mindfulness exercise.

1) [Downloadable link of audio]

(Script from Royal Free manual, adapted from *Mindfulness of the breath* in ACT Made Simple (Harris, 2009))

*Get in a comfortable position, either lying on your back or sitting. If you are sitting, keep the spine straight, keep your head upright, and let the shoulders drop. Keep an open posture with your arms and legs uncrossed. Close your eyes or soften your gaze on a spot on the floor.*

*First, start bringing your attention to your body....and notice the sensations of the points of contact with the floor, such as feelings of your feet touching the floor...and your legs resting on the chair...and the feeling of your clothing on your skin.*

*Now bring your attention to your belly, feeling it rise or expand gently on each in-breath....and fall on each out-breath. Simply become aware of the sensations and feelings associated with breathing.*

*Keep the focus on your breathing...following each breath....for its full duration...watching and seeing...just noticing what you observe. Not trying to change your breathing in anyway...just ...noticing it from moment...to moment.*

*Every time you notice that your mind has wandered off your breath...notice what it was that took you away and gently bring your attention back to the sensations of your breathing...the breath moving in and out.*

*You may notice feelings, thoughts, images, urges, or sensations arise, come into your awareness. It is natural for your mind to wander. When it does...then your only task...is simply to bring it back gently to your breath every time, no matter where it went. No need to give yourself a hard time about it...Notice any thoughts that judge...how you are doing or feeling...or any thoughts that tell you to try to “do it better” as simply other thoughts indicating your mind has wandered...and then bring the focus back...to your breathing again.*

*There may be times when pleasant feelings showing up—you may feel relaxed, calm, peaceful... There may also be times when unpleasant ones arise, such as boredom, frustration, anxiety. See if you can allow these experiences to be exactly as they are in this moment. ... Don't try to control them, just let them be as they are— regardless of whether they are pleasant or unpleasant—and keep your attention on your breathing. ...*

*You may notice that after a while...you become aware of sensations in your body. Sometimes the bodily sensations may be... intense. Instead of trying to screen out these sensations...have these sensations...and remain aware of them as you breathe. Notice any struggling with what you feel and replace that with watching. Become more aware of your body as a whole and all the sensations present. Just allow yourself to be here...with whatever comes up, without judging...Become totally here with whatever your feelings are.*

*Try to let your feelings be as they are, to feel whatever you feel without a struggle. ... Because struggling often does not help, and might amplify feelings ... So if you're noticing a difficult feeling, then silently say to yourself, 'Here's a feeling of frustration' or 'Here's a feeling of anxiety' or 'Here's a feeling of boredom'*

*And once again, if you notice that your mind has wandered off, just notice that and bring it back gently to your breathing once again. Not doing anything...not going anywhere...just simply being...just noticing...simply sitting and watching...from moment to moment...*

*And now as you come to the end of the exercise, bring your awareness back to the body, the sensations at the point of contact of your body on the chair, or wherever you are sitting.*

*And when you feel ready open your eyes, and come back into the room.'*

*Please Press 'Next' at the end of the exercise*

## **Reflecting on your experience**

When we take a few moments to actively reflect on our experience of mindfulness exercises, we can maximise their benefits.

Below there are some questions to guide the reflections that you might have had during and following the breathing exercise. Please feel free to write as little or as much as you want.

What was your experience like? What did you notice?

---

---

---

---

Were you aware of any sensations, feelings, thoughts and/or symptoms during the exercise? What were they?

---

---

---

---

---

What was it like to observe them without struggling against them? What do you think would happen if you noticed them the same way you did in this exercise, next time you felt them in your daily life?

---

---

---

---

---

Could this exercise have any relevance to your life and the way you respond to cancer and its treatment?

---

---

---

---

### **Task for next week**

Mindfulness is like a muscle – regular exercise will help it grow! We recommend that you practice this exercise 3-4 times over the next week.

As you practice, allow yourself to become more mindful of the sensations, thoughts and feelings that are happening for you. Be gentle and non-judgmental (even with your own self-judgments!)

This will make it easier to use the skills when you experience unpleasant thoughts, feelings, or physical symptoms.

#### Tips for practicing mindfulness:

- Set aside the time. It can be useful particularly in the beginning to set some time aside for practicing mindfulness skills.
- Remembering that mindfulness is not relaxation or distraction. If you feel relaxed that is fine but the point is to be aware of whatever is going on for you without judgment or avoidance.
- Being aware that mindfulness can bring up difficult things and that this is normal and provides another set of experiences to be mindful and learn what to do with.

Please ensure that you have downloaded the audio clip or the script of the exercise to your computer in a location that is easily accessible.

### **If things get difficult**

If you have any queries or concerns, please get in touch with Hannah Cox (e-mail: [Hannah.Cox.2019@live.rhul.ac.uk](mailto:Hannah.Cox.2019@live.rhul.ac.uk) or on 07940808336)

In the event that the questionnaires or activities do cause upset and you require support, we advise that you contact the medical team involved in your care and/or your GP and team at Maggie's.

*Please press 'Submit' when you have finished*

## **Module 2**

### **Mindfulness-based skills 2 - Defusion**

Welcome back!

In Module 1 we introduced the idea that all of us are drivers of the bus of life. On that bus there are a range of passengers, some of whom we probably don't like very much (i.e. difficult thoughts, feelings etc.). At times, we might feel caught up with our unwanted passengers and at those times we might find we are headed in the wrong direction – of perhaps no direction at all!

During the week you have been growing your mindfulness muscle by practicing the mindfulness of breath exercise. This helps us to stay in the here and now and to reduce our struggle against those unwanted passengers.

Now that you are more aware of your unwanted passengers, we are going to focus on the relationship you have with them. Research has shown that as long as we are fighting with our unwanted passengers, we aren't living the life we want. So, we are going to practice something new – allowing those passengers to be there and bringing our attention to the road.

### **Questionnaires**

Before continuing, here are some questionnaires to complete.

Please take your time to read the instruction at the top of the page and go through each question.

*Please Press 'Next' to begin Module 2*

### **Watch your thinking**

Sometimes, you might notice that the ignition is off and you're down the back of the bus hanging out with those unwanted passengers – maybe at times you become completely consumed by them and you can't see another way of viewing yourself, your cancer, the world or your current situation.

When in the midst of a struggle it can be difficult to look at our thoughts consistently. In these moments we are more likely to be looking from the thought rather than at the thought. Signs that you may have been looking from your thoughts rather than at them include:

- You've been struggling at times to control what you think or feel.
- You've come to define yourself and the content of your experience in accordance with your thoughts.
- You tend to take your thoughts literally. So you see life from the vantage point of your thoughts.
- These thoughts you are fused with, argue, or advocate for more struggle.
- Struggling with your thoughts isn't working.

It is likely that since being diagnosed with cancer you have experienced a whole range of different thoughts. Some of these thoughts may have been particularly difficult and distressing and perhaps others were more positive and welcomed. The mind is very good at wandering to the past, to the future, and to other places in the present. Naturally when difficult thoughts arise we want to get rid of them. By learning how to respond differently to your thoughts you can best take advantage of them to improve your well-being and your quality of life.

### **Responding differently to your thoughts**

In ACT, we are most interested in whether thoughts are useful in the bigger picture of our lives, so we won't argue over whether the thought is true or not, but rather we want to develop a different way to relate to those unwanted passengers. This means staying in the driver's seat, being aware of the rowdy bunch, and still taking your bus where you want it to go.

We are not going to get into arguments about whether the thoughts you are having are true or not. All of your thoughts are normal and understandable; it is just your mind doing what it does. Instead we are going to think about the usefulness of these thoughts. Are they helping you to live the life you want to live?



We can respond to thoughts differently by:

- Looking at them for what they are – just products of our busy minds.
- Noticing them rather than being caught up in them
- Letting them come and go, wax and wane, rather than holding on to them too strongly

We call these skills ‘defusion’ – which is a mindfulness-based skill.

Defusion involves distancing, disconnecting or seeing thoughts for what they are (streams of words, passing images), not what they say they are (dangers or facts).

The aim of defusion is to reduce the influence of unhelpful thoughts, images and memories upon your behaviour (e.g. reactions and activities) and to facilitate being present and engaged in your experience, whether positive or negative. Once we understand the nature of language and that words are just words, and thoughts are just thoughts made up of words or images, it becomes easier to modify the words’ or images and to defuse from unpleasant or difficult thoughts.

The best way to grasp what we mean by defusion is to practice an exercise!

### **Mindfulness-based skill 2 - defusion**

#### **Defusion exercise 1: “Leaves on a stream”**

Please click the link below to start the exercise.

[Downloadable link of audio]

(Script from Royal Free manual, adapted from ACT Made Simple (Harris, 2009))

*Find a comfortable position and either close your eyes or fix your eyes on a spot, whichever you prefer.*

*Imagine you are sitting by the side of a gently flowing stream and there are leaves flowing past on the surface of the stream. Imagine it however you like- it’s your imagination.*

*Now for the next few minutes, take every thought that pops into your head and place it on a leaf and let it float by. Do this regardless of whether the thought is positive or negative, pleasurable or painful.*

*If you have some thoughts that are sentences of words, then place those words on the leaf. If you have thoughts that are pictures, then place those words on a leaf.*

*If your thoughts stop, just watch the stream. Sooner or later your thoughts will start up again.*

*Allow the stream to flow at its own rate. Do not speed it up. You are not trying to wash the leaves away- you are allowing them to come and go in their own good time.*

*If your mind is saying ‘this is stupid’ or ‘I cannot do this’ then put those thoughts on a leaf and let it float by.*

*If a leaf gets stuck then let it hang around, don’t force it to float away.*

*If a difficult feeling arises, such as boredom or impatience, simply acknowledge it. Say to yourself, “Here’s a feeling of boredom” or “Here’s a feeling of impatience.” Then place those words on a leaf, and let the leaf float on by.*

*From time to time your thoughts will hook you and you will lose track of the exercise. This is normal and natural and it will keep happening. As soon as you realize it has happened, gently acknowledge it and start the exercise again.*

*Please Press 'Next' at the end of the exercise*

### **Reflecting on your experience**

When we take a few moments to actively reflect on our experience of mindfulness-based exercises, we can maximise their benefits.

Below there are some questions to guide the reflections that you might have had during and following the defusion exercise. Please feel free to write as little or as much as you want.

What was your experience like? What did you notice?

---

---

---

---

What sort of thoughts hooked you? What was it like to let thoughts come and go without holding on? Was it hard to let go of any thoughts in particular?

---

---

---

---

What feelings showed up? Was acknowledging the feeling useful?

---

---

---

---

Could this exercise have any relevance to your life and the way you manage cancer and its treatment?

---

---

---

---

*Please Press 'Next'*

### **Task for next week**

Remember, mindfulness needs training, just like a muscle. We recommend that you practice the 'Leaves on a Stream' exercise 3-4 times over the next week.

Practice will make it easier to use the skill when you experience difficult thoughts.

Please ensure that you have downloaded the audio clip or the script of the exercise to your computer in a location that is easily accessible.

### **If things get difficult**

If you have any queries or concerns, please get in touch with Hannah Cox (e-mail: Hannah.cox.2019@live.rhul.ac.uk and 07940808336)

In the event that the questionnaires or activities do cause upset and you require support, we advise that you contact the medical team involved in your care and/or your GP or Maggie's Centre.

*Please press 'Submit' when you have finished*

## **Module 3**

### **Mindfulness-based skills 3 – Acceptance**

Welcome back!

In Module 2 we looked at the role of our thoughts and learnt about the impact they can have on our behaviour when we get caught up in them and take them literally.

During the week you have practiced a mindfulness-based exercise (Leaves on a stream) to help you respond to your thoughts in a different way, by noticing them without holding onto them.

This week we will continue to work on building a different relationship with the passengers on your bus by developing a curious openness and kind compassion towards them through a mindfulness-based skill that we call 'acceptance'

### **Questionnaires**

Before continuing, here are some questionnaires to complete.

Please take your time to read the instruction at the top of the page and go through each question.

*Please Press 'Next' to begin Module 3*

### **What do we mean by acceptance?**

You might have noticed through the practice of the mindfulness-based exercises over the past two weeks that we are helping you to manage your private internal experiences in a different way.

Acceptance is the willingness to have difficult and unwanted passengers on our bus so that we can drive in the direction that is most meaningful to us. It does not mean giving up all hope, being defeated or agreeing with our suffering. Rather, it's about allowing our difficult internal experiences to be there and to allow them to come and go without fighting them.

Our minds often tell us that these negative feelings (such as fear, anger or low mood) are unbearable. However, this doesn't have to be the case. Suppose you learned how to make room for unpleasant feelings instead of fighting against them or trying to avoid them. How might that benefit you? What would you be doing differently in your life? We know that the more we try to avoid or suppress difficult thoughts and feelings the louder and more distressing they can become.

### TUG OF WAR WITH A MONSTER METAPHOR

*Another way that we could look at this concept is to see it a little bit like tug of war!*

*Imagine that you are engaged in a tug of war with a 'cancer and its treatment and all the distress that comes with it' monster. You have one end of the rope and the monster has the other end. And, in between you there is a huge bottomless pit, and you are pulling backwards as hard as you can but the monster keeps on pulling you ever closer to the pit. What is the best thing to do in this situation?*

*Pull harder?*

*Well that is what comes naturally but the harder you pull the harder the monster pulls so you are stuck. What do you need to do?*

*Get other people to help?*

*Yes, but when all of you pull harder the monster pulls just as hard as all of you. What else could you do?*

*Drop the rope?*

*That is it. When you drop the rope the monster is still there but now you are no longer tied up in a struggle with it. Not you can do something more useful.*

*What kind of monsters are you struggling with? What do you think your life would be like if you dropped the rope? If you stopped the struggle with the monster? If you accepted that the monster was there but took action to live in accordance with your values anyway?*

Battling with our internal experiences and trying to make thoughts and feelings go away can actually in turn make them more difficult to manage.

Acceptance can be defined as willingness to address an unchangeable situation or a life experience. According to dictionary.com, acceptance is defined as, "the mental attitude that something is believable and true." Accepting that you have cancer (or that cancer is real and true) is different to giving up all hope. Instead of focusing attention on trying to feel better, acceptance involves learning *how* to feel better.

### **Mindfulness-based skill 3 – Acceptance through opening up to a difficult feeling**

We are now going to practice an acceptance exercise. We are going to bring to mind a situation, thought, or experience that carries with it a difficult feeling. This may be an experience related to cancer or it may be about something else. We would just like you to mull over this experience for a few minutes.

The aim of this exercise is not to change or get rid of feelings but to make room for them and allow them to be there without the struggle.

The aim of opening up is to allow feelings to be as they are. We are not trying to change them or control them.

When difficult feelings show up such as anxiety, anger or sadness, or an unpleasant physical symptom, simply acknowledge it. Try silently saying to yourself “here’s a feeling of anxiety” or “here’s a feeling of pain”.

Before we do the exercise please take a moment to think about what kind of emotions you might want to use.

Please click the link below to access the acceptance exercise.

(Script from Royal Free manual, adapted from *Mindfulness of the breath* in ACT Made Simple (Harris, 2009))

*I invite you to sit upright in your chair with your back straight and your feet flat on the floor. Most people feel more alert and awake sitting this way so give it a try and see if this is the case for you. If you are comfortable to close your eyes, please do so, or focus on the floor in front of your feet.*

#### OBSERVE

*Take a few slow, deep breaths and really notice the breath flowing in and out of your lungs (pause 10 seconds). Now quickly scan your body from head to toe, starting at your scalp and moving downward and notice the sensations you can feel in your head... throat... neck... shoulders... chest... abdomen... arms... hands... legs... and feet. Now zoom in on the part of your body where you are feeling this feeling most intensely. Observe the sensation closely as if you are a curious scientist who has never encountered anything like this before (pause 5 seconds). Observe the sensation carefully ... Let your thoughts come and go like passing clouds, and keep your attention on the feeling ... Notice where it starts and where it stops ... Learn as much about it as you can... If you drew an outline around it what shape would it have? ... Is it on the surface of the body or inside you, or both? How far inside does it go? ... Where is it most intense? .... Where is it weakest?*

*If you drift into your thoughts, as soon as you realize it, come back and focus on the sensation.... Observe it with curiosity... (pause 5 seconds).*

#### BREATHE

*As you are observing this feeling, breathe into it... Imagine your breath flowing into and around this feeling.... Breathing into and around it...*

#### EXPAND

*And as you are breathing into it, its as if in some magical way, all this space opens up inside you ... You open up around this feeling ... Make space for it ... Expand around it ... However you make sense of that ... Breathing into and opening up around it.*

#### ALLOW

*And see if you can just allow this feeling to be there. You don’t have to like it or want it ... Just allow it... Just let it be ... Observe it, breathe into it, open up around it and allow it to be as it is (pause 10 seconds). You may feel a strong urge to fight with it or push it away. If so, just acknowledge the urge is there without acting on it. And continue observing the sensation (pause 5 seconds). Don't try to get rid of it or alter it. If it changes by itself that's ok. Your aim is simply to allow it ... to let it be (pause 5 seconds).*

#### SHOW SELF-COMPASSION

*Take one of your hands and place it on this part of your body ... imagine that this is a healing hand ... the hand of a loving friend or a parent, or a nurse ... and feel the warmth flowing from your hand into your body ... not*

*to get rid of the feeling but to make room for it ... to soft and loosen up around it. Hold it gently as if it's a crying baby or a frightened puppy... imagine you are feeling deeply caring and compassionate for someone who is in pain. What comforting words might you say to them? Try saying these words in your mind to yourself now.... And letting your hand fall, once again breathe into the feeling and expand around it.*

## EXPAND AWARENESS

*Life is like a stage show ... and on that stage are all your thoughts, and all your feelings, and everything that you can see, hear, touch, taste and smell ... and for the last few minutes, we dimmed the lights on the stage and we shined a spotlight on this feeling ... and now its time to bring up the rest of the lights ... SO bring up the lights on your body ... notice your arms and legs and head and neck ... and notice that you are in control of your arms and legs, regardless of what you are feeling ... Just move them around a little to check that out for yourself ...and now take a stretch and notice what you can hear ... and notice that there is not just a feeling here ... there is a feeling inside a body, inside a room, inside a world full of opportunity... and welcome back!*

*Please Press 'Next' at the end of the exercise*

### Reflecting on your experience

When we take a few moments to actively reflect on our experience of mindfulness-based exercises, we can maximise their benefits.

Below there are some questions to guide the reflections that you might have had during and following the acceptance exercise. Please feel free to write as little or as much as you want.

What was your experience like? What did you notice?

---

---

---

---

What was it like to observe your feelings, thoughts or symptoms without struggling against them?

---

---

---

---

What do you think would happen if you noticed them the same way you did in this exercise, next time you felt them in your daily life?

---

---

---

---

Could this exercise have any relevance to your life and the way you manage cancer and its treatment?

---

---

---

---

---

---

*Please Press 'Next'*

### **Task for next week**

Over the next week, if a difficult feeling comes up, we encourage you to try and practice the skill of opening up to it, allowing it to be there, like the bus driver continuing to drive despite the unwelcome passengers raising their voice.

This goes hand in hand with disentangling ourselves from unhelpful thoughts, which we talked about in Module 2. As we make contact with our difficult feelings, we defuse from our thoughts about them.

By dropping the struggle with your private painful experiences, you will allow yourself to have more space to think and do more of what really matters to you.

As with every new skill, opening up to difficult feelings requires practice to gain maximum benefit, but the more you practice the easier it will become. We encourage you to practice the acceptance exercise at least 3-4 times over the next week.

Please ensure that you have downloaded the audio clip or the script of the exercise to your computer in a location that is easily accessible.

If over the next week you notice yourself avoiding or trying to get rid of an unpleasant internal experience we would encourage you to reflect on the cost of the avoidance and to continue practicing opening up to difficult internal experiences with kindness and self-compassion.

*Please press 'next'*

### **If things get difficult**

If you have any queries or concerns, please get in touch with Hannah Cox (e-mail: [Hannah.Cox.2019@live.rhul.ac.uk](mailto:Hannah.Cox.2019@live.rhul.ac.uk) and 07940808336).

In the event that the questionnaires or activities do cause upset and you require support, we advise that you contact the team involved in your care and/or your GP and your team at Maggie's.

*Please press 'Submit' when you have finished*

## **Module 4**

### **Choosing a valued direction – Values**

Well done on reaching module 4! We hope that you have found the modules helpful so far. If you have been managing to practice the mindfulness exercises regularly, that's great! If you have been finding it tricky to find the motivation or the time to practice the between session mindfulness exercises please do not be hard on yourself. We know that this can prove difficult and is completely normal. While it is not uncommon for

people to find it difficult to schedule in time to do the exercises, we also know that in order to get the most benefit from this ACT programme, it is important to practice the mindfulness skills. We would encourage you to keep doing the best you can.

In Module 3 we looked at acceptance, the process of opening up to difficult experiences, actively making room for them instead of struggling against them, so that you have more space to focus on what really matters to you. Opening up is the process of actively making room for unwanted private experiences. It goes hand in hand with disentangling ourselves from unhelpful thoughts, which we talked about in module 2. As we make contact with our difficult feelings, we defuse from our thoughts about them. And as we notice our thoughts and allow them to be as they are, we open up more to the feelings they create.

Acceptance of cancer and its treatment is not giving up or “throwing in the towel”. Rather, acceptance is facing your struggles for what they are as normal human experiences without attempting to control or change them. This process then allows you to move in valued directions in areas of your life that you have defined as important to you.

Now that you have developed new ways to relate to your unwanted passengers, it’s time to start setting the direction of the bus called ‘your life’. We will be doing this by looking together at your values - the things you most care about in your life.

*Please Press ‘Next’ to begin Module 4*

### **Knowing what matters: Your values**

By practicing mindfulness-based skills in the past few weeks, you’ve learnt to relate to your feelings, thoughts and physical sensations in a different way, so you don’t get so caught up in them and made room to put energy into doing things that make life meaningful.

Having cancer and undergoing treatment for cancer can sometimes feel like it dominates your life, with little time for doing the things that really matter to you (e.g. socialising with friends).

Sometimes, people find that they are waiting for a time when cancer is less of a problem before they can do the things that really matter to them.

But we have seen that while the bus is parked up, it’s just not headed in the direction that the driver had hoped for.

Using ACT, we want to set the direction of your bus today, alongside the unwanted passengers and the challenges of living with cancer and its treatment.

We will help you to learn how to do this by looking at your values.

Values are the things that are most important to you, what matters to you in the big picture of your life, what you want to stand for in life, the personal qualities you want to develop.

It can be tricky sometimes to decipher between our values and our goals. Asking, “can the value be achieved?” can be a helpful way to differentiate. If the answer is ‘yes it can be achieved’, it may be a goal rather than a value. Values are not goals or feelings, nor do they mean that our paths are always straightforward.



You can think of values as being a bit like a compass. Values are the directions that we want our life to be headed in.

To live a valued life is to act in the service of what you value.

The aim of the next section is to help you think about and define your own values using a short exercise.

*Please Press 'Next'*

## **Your values**

Below are domains of life that are valued by some people. These will mean different things to different people, and that's okay, we just want you to think about what they mean to you. There may be aspects of life you don't value much, and that's okay too.

You are going to be shown a series of cards on the computer and we would like you to sort the cards into three piles - 'very important', 'quite important' or 'not important'. You do this by clicking on, dragging and dropping the card into the relevant pile with your mouse. If you have a value that isn't shown on one of these cards, you can write it in the 'Other' option at the bottom of the cards.

As you do this card-sorting task, try to think about:

- What is important to you deep down?
- What do you most care about?
- What do you want your life to stand for?
- What would you like to work towards?

As you complete this exercise, you may find some areas in which you have not been living in line with your values as much as you would like and that's absolutely normal. The aim of this exercise is to help you identify *your values* so you can then decide where to begin working towards your most important value.

Family (other than marriage or parenting)

Close personal relationship (e.g. marriage, intimate relationships)

Parenting / Having children or more children

Friendships / social life

Career / Employment (paid or voluntary)

Education / Training / Personal Growth and development

Leisure activities / Recreation / Fun

Spirituality / Religion

Citizenship / Environment / Community Life

Health / Self-care / Medical care

Independence / Motivation / Self-confidence

Other very important areas of life (not listed above)  
\_\_\_\_\_  
\_\_\_\_\_

Very Important to Me

Quite important to me

Not Important to me

*Please Press 'Next'*

From the values that you identified as 'very important', choose one value that would be most important to be working on right now. Perhaps it's something that's really meaningful to you but you don't feel very connected to it or you feel dissatisfied with how much your life is guided by this value at the moment.

Difficult feelings and thoughts might

come up as you make this choice, these are the passengers that want to have their say on the turn you're taking but remember that you are the one who decides the direction of the bus.

My top value is: \_\_\_\_\_

Please use the space below to describe why this value is important and meaningful to you.

Try to think about a time in your life that this was particularly important to you and made you feel good about yourself.

Write as much or as little as you wish and don't worry about how well it's written. Just focus on expressing your memory of the event(s) and the feelings that you had at the time.

Please do your best to think and write about this event and your feelings about this value for the next 10 minutes. However, it's OK if you complete the task before the 10 minutes is up.

---

---

---

---

---

---

---

---

---

---

### **Task for next week**

Over the next week, we encourage you to continue thinking about the direction of your bus by making a note on your phone or on a piece of paper of all the times your value showed up for you, or if there is something you're already doing that is consistent with that value.

Remember that when reflecting upon our values and the extent that we may or may not have been living in line with them difficult thoughts or feelings may arise. If these passengers come up, we encourage you to practice the mindfulness-based skills discussed in the earlier modules, by looking at them with kindness, curiosity and compassion.

Please ensure that you have written down/downloaded the list of values and you have them in a location that is easily accessible. You will also be sent a copy of your answers via e-mail.

Try to take 10-15 minutes 3-4 times this week to practice mindfulness. You can use any of the methods that we have used so far.

### **If things get difficult**

If you have any queries or concerns, please get in touch with a member of the research team ([Hannah.cox.2019@live.rhul.ac.uk](mailto:Hannah.cox.2019@live.rhul.ac.uk) and 07940808336)

In the event that the questionnaires or activities do cause upset and you require support, we advise that you contact your care team and/or your GP and your team at Maggie's

*Please press 'Submit' when you have finished*

## **Module 5**

### **Committing to doing it: goal setting**

Welcome back!

In Module 4 we thought about values – what matters to you the most in life. Thinking back to the analogy of your bus of life, values can be the directions that you want your life to be heading in.

During the week you may have had the chance to think more about your values and the things that most matter to you in life.

In this module, we are going to spend some time thinking about the things that you can do in your day to day life that help your bus to continue to travel in the direction that you want it to be heading in – your valued direction.

### **Questionnaires**

Before continuing, here are some questionnaires to complete.

Please take your time to read the instructions at the top of the page and go through each question.

## **Translating values into action: setting goals**

Research tell us that our values can help us with setting goals in day to day life, as well as help to guide us when making decisions. Using values – the things that most matter to us in life - to guide what we do from day to day can be good for our well-being.

What we value and the way in which we connect with our values can change as we go through different life experiences. For example, 'having fun' could be a value that remains a constant throughout your life but changes in your physical abilities may mean that the way in which you have fun differs across the lifespan.

We can think of our goals as the signposts that indicate we are on our way to values. Specific actions are the behaviours that occur which add up to us achieving a goal. Much like directions while on a journey, values, goals and actions can provide guidance as we live our lives. With values identified, it is now time to set some of your own goals.

### **Goal Setting - What is it?**

A goal is an activity or aim you would like to carry out or achieve. Goal setting is a process that enables you to gain control of your activities and plan what you do and how much at any one time.

When setting goals it is also important to give consideration to both short-term and long-term objectives. We can think of short-term goals as the points on the map that are attainable in the near future. Long-term goals are further down the road. Ensuring that we have both short-term and long-term goals allows for a well-paced journey that leads from one guidepost to the next.

When setting our own goals, we need to have patience and also ensure that our goals are SMART:

- Specific
- Measurable
- Achievable
- Realistic
- Time-limited

Let's start thinking about your own value-based goals. Here are some examples to help you with this task:

#### **Example 1:**

A person who views 'parenting' as their top value might decide that they want to play more with their kids. Their goal might be to take their children to the park on the weekend, or to set time aside to play with them a few times a week.

#### **Example 2:**

A person who selected 'relationships' as a top value might decide they want to invest more time in reaching out to their family and/or friends. Their goal might be to call their friend once a week or meet up with a friend every other week.

#### **Example 3:**

A person who selected 'education and growth' as a top value might decide they want to find new opportunities to learn and grow as a person. Their goal may be to join a new group or club in an area that

interests them, or to access online resources and books to find out more about something they are interested in, or to enroll in a new class.

*Please Press 'Next'*

Goal setting can take some practice so initially we would suggest focusing on short-term goals. Work through the steps below to start creating your own value based goals.

**Step 1.** Write down the top value you identified last week:

My top value is: \_\_\_\_\_

**Step 2.** What is my goal associated with this value?

(What do you want to achieve? Try to be specific, for example: 'To go for a fifteen minute walk four times a week')

---

---

---

**Step 3.** What do I need to do to reach my goal:

(How will you achieve it? Break down the goal into smaller chunks to make it attainable, for example: 'I will plan my route in advance', 'I will leave my trainers by the front door the night before', 'I will decide what days I am walking each week in advance')

---

---

---

**Step 4.** How will I know that the goal has been achieved?

(How can you measure what you have achieved? For example, set a date and a time in the diary and tick it off once you've achieved it, or tell a friend to hold you accountable for it)

---

---

---

If you have been able to identify one value based goal to get started with that's great. You may feel that one goal is enough for now or you may wish to repeat the above process for some of the other values you identified last week. Remember that there is no right or wrong in terms of the number of goals you may have.

Goal setting can be tricky and can bring up some difficult self-critical thoughts. If you find yourself getting caught in self-critical thoughts just remember that your mind is talking to you again and you can use the strategies that you've learned already to set your compass in the direction you want to live.

Please make a note of your goal on a piece of paper or anywhere that is a personal reminder of the goal. You will also be sent a copy of your answers via e-mail.

*Please Press 'Next'*

## **Task for next week**

Time to put this into action and begin taking steps. Over the next week see if you can work towards the goal you identified. You may find that it helps to jot the goal down on your phone or put it on a post-it-note on the fridge – or both! - and review your progress towards it.

If you find yourself having trouble thinking of actions and goals, refer back to the goal setting examples. We will integrate your identified goals and actions, as well as values, throughout the remainder of the modules.

Try to take 10-15 minutes 3-4 times this week to practice mindfulness. You can use any of the methods that we have used so far.

## **If things get difficult**

If you have any queries or concerns, please get in touch with Hannah Cox (e-mail: [Hannah.cox.2019@live.rhul.ac.uk](mailto:Hannah.cox.2019@live.rhul.ac.uk) and 07940808336)

In the event that the questionnaires or activities do cause upset and you require support, we advise that you contact the medical team involved in your care and/or your GP or your local Maggie's Centre.

*Please press 'Submit' when you have finished*

## **Module 6 Bringing it all together**

Welcome back!

In Module 5 we saw how values - the things you most care about in life - can help us to set goals. Regularly reviewing values-based goals means that day to day life can start to be positively influenced by the things we most care about in life, which can often get forgotten when we are faced with a health problem, such as cancer.

Last week we showed you how to set a value-based goal to get you started. How did you find doing this? Did you remember to do it? If so, well done! Did you work towards that goal? If so, that's great!! Did you achieve the goal? If so – fantastic! Did things go wrong? Did barriers get in the way? If so, that's absolutely to be expected and we will think a bit more about these barriers today. Every day is a fresh opportunity to remember our values and to work towards them.

*Please Press 'Next'*

## **Questionnaires**

Before continuing, here are some questionnaires to complete.

Please take your time to read the instruction at the top of the page and go through each question.

*Please Press 'Next' to begin Module 6*

## Barriers to taking values-based action

It is important to expect setbacks and remember that barriers and difficulties are part of living this human life. Barriers may be *external* such as practical issues (e.g. time, finances, weather, facilities, medical appointments and treatments, other commitments etc.) or *internal* (e.g. feelings, physical symptoms, doubts, self-critical thoughts, etc.). You can think of these as the unwanted passengers on your bus as they start to get rowdy and unsettled.

We're all generally very good at coming up with reasons for why we can't or shouldn't do things that can take us in a new direction, but if we keep listening to those passengers, they'll hold us back.

We can reduce the impact of psychological and practical barriers by anticipating them and can work towards getting better at taking action, at staying on track and catching ourselves when we go off-track.

As you have progressed through these modules you have essentially been planning for action. This programme's approach may have been completely new, and you may have found yourself questioning many logical assumptions that you had regarding living with the impact of cancer and its treatment. At this point there is a decision to be made, action or inaction. Which directions do you choose and are these directions worth it to you?

Moving your bus in the direction that you have stated to be important and of value to you is essential. However, as we know, unwanted passengers will get in the way of you driving your bus even though you have taken great efforts to plan and prepare for action. What barriers have gotten in your way?

Someone who has quit smoking recently invariably has a stressful day. Obviously, this experience presents a barrier to continued action – it is easier for them to reach for a cigarette in an effort to make them feel better. However, in what ways does this behaviour impact their values and goals?

So, what are your barriers? Do they ever cause problems or difficulties? What is to be done when this occurs?

*Please Press 'Next'*

## Willingness and Action Plan

We have seen in previous modules that being open and willing to continue driving despite the unwanted passengers allows the driver to head in the direction that he or she is hoping for.

When it comes to barriers, it can first help to identify any possible obstacles and then consider how to tackle them.

1) What practical barriers may / did get in the way of your value-based goal?

---

---

2) Any ideas to help overcome these practical barriers?

---

---

3) Which thoughts/memories, feelings and physical sensations am I willing to make room for in order to achieve this goal?

Thoughts/memories:

---

---

Feelings:

---

---

Physical sensations:

---

---

4) When barriers show up it would be useful to tell myself that:

---

---

---

5) When barriers show up I could use the following ACT strategies:

---

---

---

Remember, The best way to work on barriers is through action. Life is hard and living with cancer and its treatment can make it so much tougher. It can, however, be helpful to remember that in addition to being hard, life is also so many other things. Choosing the direction of your bus and continuing on the journey isn't always easy, but finding the freedom to choose can be liberating. The choice isn't whether or not to have pain but whether or not to live a meaningful life despite the pain and the barriers that arise.

*Please Press 'Next'*

### **Coping with future setbacks – being AWARE (adapted from RF manual)**

Well done on having worked through the modules and exercises so far. Think about how far you have come in only 6 weeks and how far you may get if you keep trying.

There might be times in the future when things don't go as well as you'd like them to go, but you may now understand that setbacks and difficulties are part of living this human life and managing the challenges that a cancer diagnosis brings. It's how we respond to these challenges that makes the difference.

Through this ACT programme you have learnt that we can notice our private experiences, open up to them and be willing to accept that they might be there, as unwanted passengers on our bus, while we continue driving in our valued direction.

Here is an acronym that can help you remember the steps of this programme: A-W-A-R-E

1. **Practice ACCEPTING** that there will be unwanted passengers on your bus as you pursue a life that is deeply meaningful to you. Practice, as best you can, allowing them to be there for the ride without fighting against them. Remembering that accepting something does not mean that you like it, but that you are willing to experience it rather than battle against it.



2. **WATCH** what happens in the here and now. Observe your unwanted passengers as they come and go. Try, as best you can, to watch your experience in the here and now without getting too caught up in them.
3. **ACT** according to your values. Set specific and achievable goals to ensure that you are moving towards the direction that you've set for your bus.
4. **REPEAT** the steps. Continue to (1) ACCEPT, (2) WATCH your experience (3) ACT on values.
5. **EXPECT** to feel things that are undesirable. Don't be surprised the next time you have an unpleasant symptom. Instead, surprise yourself with how you handle it.

*Please Press 'Next'*

### **Task for the next month**

Well done for completing the programme!

We encourage you to reflect on the barriers that might come up for you as you set goals to continue your journey towards your valued direction by using the exercise you practiced in this module.

All the skills that you've learnt require regular practice exactly like our muscles, so the more you remember to practice the mindfulness-based skills of present moment focus, defusion and acceptance, the more room you will have to focus day to day on the things that you most care about.

We will send you a copy of the Action Plan worksheet and the AWARE steps via email.

We will be in touch over the coming days to hear about how you found the programme.

On the next page you will be presented with some questionnaires for completion. We kindly ask that you complete these and continue to fill in the daily measures for the next four weeks. At the end of the four weeks, we will ask you to complete the three questionnaires once more.

### **If things get difficult**

If you have any queries or concerns, please get in touch with a member of the research team on 07940808336 or contact Hannah (e-mail: [Hannah.cox.2019@live.rhul.ac.uk](mailto:Hannah.cox.2019@live.rhul.ac.uk))

In the event that the questionnaires or activities do cause upset and you require support, we advise that you contact the medical team involved in your care and/or your GP and your team at Maggie's

## Appendix M

### General Practitioner Participation Letter



Hannah Cox  
Trainee Clinical Psychologist  
Department of Clinical Psychology,  
Royal Holloway,  
University of London,  
Egham  
Surrey  
TW20 0EX  
Telephone: 07940808336  
Email: Hannah.cox.2019@live.rhul.ac.uk

Date: 24/05/2022

Dear Dr [GP]

RE:

DOB:

Address:

I am writing to inform you that the above-named patient of yours has consented to participate in a study entitled '**Development and pilot testing of an online ACT intervention for improving psychological outcomes and quality of life for adults with cancer.**'

The aim of the project is to establish the acceptability and feasibility of a new web-based psychological treatment for people undergoing treatment for cancer, and to also examine the preliminary effectiveness of the intervention. The study is being undertaken as part fulfilment for a doctorate qualification in clinical psychology. Ethical approval has been obtained from the Research Subcommittee at Royal Holloway and by the University's ethics committee. The study is also being supervised by two qualified Clinical Psychologists and researchers.

We do not anticipate having to contact you over the course of the study but if your patient does indicate to us that they may be at risk at any point during the intervention we will keep you informed. Participants will be made aware of ways that they can access additional psychological support if needed throughout the study.

I enclose a copy of the participant information sheet for your interest.

Should you have any questions or require further information about this research, please do not hesitate to contact me on the telephone or email address above.

**Yours sincerely,**

Hannah Cox  
Trainee Clinical Psychologist and Principal Investigator  
*Enclosed: Participant information sheet*

## Appendix N

### Reference Data for Reliable Change Index and Clinically Significant Change Calculations

**Table N1**

*Reference data*

Measure	Cronbach's $\alpha$ (source)	Clinical norm (source)	CSC criterion
<i>HADS overall</i>	.94 (Lloyd-Williams et al., 2001)	12.30 (Wondie et al., 2020)	B
<i>HADS anxiety subscale</i>	.80 (Lloyd-Williams et al., 2001)	6.8 (Wondie et al., 2020)	B
HADS depression subscale	.75 (Lloyd-Williams et al., 2001)	5.5 (Wondie et al., 2020)	B
Cancer DQoL	.94 (Davidson, 2020)	-3.22 (Davidson, 2020)	A

*Note.* M = Mean; SD = Standard Deviation

## Appendix O

### Acceptability data

**Table O1**

*CSQ-8 raw Scores and Acceptability Conversion*

CSQ-8 total/32	Acceptability /100
23	72%
23	72%
28	88%
21	66%
26	81%

**Table O2**

*Percentage of Agreement on User-friendliness and Appropriateness*

	Strongly Agree	Somewhat agree
The information on the online ACT programme was easy to understand	60%	40%
The information on the ACT programme was clear in meaning	20%	80%
The information on the online ACT programme was informative	20%	80%
The information on the online ACT intervention was relevant to me	20%	80%
The online ACT programme was user friendly	20%	80%
The online ACT programme was easy to use	20%	80%

**Table O3***Qualitative Feedback on the Online ACT Intervention*

	What was most helpful about it?	What was least helpful about it?
Feedback 1	It helped reinforce the importance of keeping a sense of perspective about life in general	Nothing
Feedback 2	Enabled me to fit in responses requested at times that suited me	Repetition of the "passengers on a bus" visualisations
Feedback 3	Some really good tools, I liked module 1 - breathing and noticing feelings, Module 2 (leaves on a stream) was my favourite and one exercise that I adopt a lot in practice. Other modules 5 and 6 were thought provoking i.e. the values and goals. I didn't like module 3 on acceptance as much.	On the audio recordings it wasn't always obvious that you had reached the end of the recording or whether you were still supposed to be breathing/focusing or whatever you were practising.
Feedback 4	To be able to go back and check information	Not having human interaction.
Feedback 5	That it confirmed what I know about mindfulness already. Also showed other ways of viewing and dealing with my diagnosis.	Nothing

**Table O4***Further Qualitative Feedback*

	Comments
Feedback 1	<p>"This would make a really helpful toolkit whilst waiting for cancer treatment to start"</p> <p>"I found the goal setting module really helpful in terms of supporting me to planning although struggled to separate a value from a goal"</p> <p>"Leaves on a stream was my favourite exercise, I continue to use it now"</p>

---

Feedback 2	<p>“The intervention particularly helped me with my anxiety whilst going through treatment”</p> <p>“I enjoyed the goal setting module and found the language really accessible”</p>
Feedback 3	<p>“The intervention being online makes it really convenient”</p> <p>“I thought the intervention was really great and think that access should ideally be provided as soon as possible within treatment programmes for cancer patients”</p>
Feedback 4	<p>“When first diagnosed my life was flipped on its head and this would have been very helpful then”</p> <p>“I preferred the later modules as I found there was a bit more depth to it. I could have handled more complexity in the earlier modules e.g. a deeper level to the metaphors”</p> <p>“I think it would be helpful if you could provide a clear bullet point summary of each module after they are completed as a reference for the user, it’s easy to forget...like a handout or something just containing the key points to take away”</p>
Feedback 5	<p>“I am someone who I think prefers face to face contact, but it would be wonderful if a mixture of online and face to face were used. People can wait a long time for in person support so this (the intervention) could be really useful in that gap”</p>

---

## Appendix P

### Tau-U Data

**Table P1**

*Tau-U for Each VAS Variable*

	Low mood		
	Comparison	Tau	<i>p</i> -value
P1	A x B	-0.0782	0.6377
	B x a	-0.3143	0.0506
	A x (B + a)	-0.0889	0.5998
P2	A x B	-0.2571	0.2877
	B x a	0.1363	0.472
	A x (B + a)	-0.2202	0.3501
P3	A X B	-0.5461	0.006**
	B x a	-0.4921	0.0048**
	A x (B + a)	-0.5186	0.0021**
P4	A x B	-0.2232	0.2565
	B x a	-0.4921	0.0048**
	A x (B + a)	-0.4270	0.0166*
P5	A x B	-0.7143	0.0039**
	B x a	-0.2143	0.4161
	A x (B + a)	-0.6555	0.0069**
P6	A x B	-0.0435	0.8193
	B x a	-0.087	0.6174
	A x (B + a)	-0.0851	0.6134
	Anxiety		
	Comparison	Tau	<i>p</i> -value
P1	A x B	-0.2391	0.1499
	B x a	0.0980	0.5423
	A x (B + a)	-0.2115	0.1705
P2	A x B	-0.2571	0.2877
	B x a	0.1473	0.4370

	A x (B + a)	-0.2173	0.3567
P3	A x B	-0.5658	0.0044**
	B x a	-0.1523	0.3800
	A x (B + a)	-0.6556	0.0001***
P4	A x B	-0.4911	0.0125*
	B x a	-0.5040	0.0039**
	A x (B + a)	-0.6587	0.0002***
P5	A x B	-0.5612	0.0233*
	B x a	-0.3571	0.1753
	A x (B + a)	-0.6134	0.0114*
P6	A x B	-0.0408	0.8304
	B x a	0.1581	0.3638
	A x (B + a)	0.0417	0.8057
<hr/>			
	Pain		
	Comparison	Tau	<i>p-value</i>
P1	A x B	0.1414	0.3946
	B x a	-0.3619	0.0244*
	A x (B + a)	0.0056	0.9708
P2	A x B	-0.6914	0.0182*
	B x a	0.1345	0.6426
	A x (B + a)	-0.5476	0.0202*
P3	A x B	-0.6776	0.0006***
	B x a	-0.2256	0.1934
	A x (B + a)	-0.7952	0.0000***



P4	A x B	0.3571	0.0694~
	B x a	-0.6627	0.0001***
	A x (B + a)	0.0698	0.6951
P5	A x B	-0.4898	0.0478*
	B x a	-0.6627	0.3428
	A x (B + a)	0.0698	0.0545
P6	A x B	-0.0163	0.9317
	B x a	-0.2905	0.0951
	A x (B + a)	-0.1625	0.3375

		Fatigue	
	Comparison	Tau-U	P-value
P1	A x B	-0.0120	0.9422
	B x a	-0.5361	0.0009**
	A x (B + a)	-0.2124	0.1687
P2	A x B	-0.5143	0.0335*
	B x a	-0.0571	0.7630
	A x (B + a)	-0.5298	0.0246
P3	A x B	-0.6020	0.0136*
	B x a	-0.3209	0.1934
	A x (B + a)	-0.7169	0.0003***
P4	A x B	-0.6577	0.0008***
	B x a	-0.0536	0.7587
	A x (B + a)	-0.6651	0.0002***
P5	A x B	-0.8622	0.0005***
	B x a	0.2738	0.2988
	A x (B + a)	-0.8445	0.0005***

P6	A x B	-0.3967	0.0371*
	B x a	0	1
	A x (B + a)	-0.3967	0.0188*
<hr/>			
<hr/>			
Mindfulness			
<hr/>			
	Comparison	Tau-U	<i>P</i> -value
P1	A x B	-0.5504	0.0009***
	B x a	0.2558	0.1116
	A x (B + a)	-0.4859	0.0016**
P2	A x B	-0.2898	0.2309
	B x a	0.2989	0.1147
	A x (B + a)	-0.2143	0.3633
P3	A x B	-0.5230	0.0085**
	B x a	-0.2293	0.1861
	A x (B + a)	-0.6742	0.0001***
P4	A x B	-0.4732	0.0161
	B x a	-0.4702	0.0070**
	A x (B + a)	-0.6889	0.0001***
P5	A x B	-0.6786	0.0061**
	B x a	-0.7024	0.0077
	A x (B + a)	-0.7269	0.0027
P6	A x B	-0.0761	0.6894
	B x a	-0.1838	0.2911
	A x (B + a)	-0.1597	0.3458

---

Note. P1 = participant 1; P2 = participant 2; P3 = participant 4; P5 = participant 5; P6 = participant 6; A = Baseline; B = Intervention; a = Follow-up; \* =  $p < .05$ ; \*\* =  $p < .01$ ; \*\*\* =  $p < .001$ ; ~ = baseline corrected for trend.

**Table P2**

*Summary of Statistical Change (Tau-U) Across Idiographic Variables*

Idiographic Variable	Phase Contrast	Number significantly improved (P)	No significant change (P)	Significant deterioration (P)
Low mood	AxB	2 (P3, P5)	4 (P1,P2,P4,P6)	0
	B x a	2 (P3, P5)	4 (P1, P2, P4, P6)	0
	A x (B+a)	3 (P4, P4, P5)	3 (P1, P2, P6)	0
Anxiety	A x B	3 (P3, P4, P5)	3 (P1, P2, P6)	0
	B x a	1 (P4)	1 (all but P4)	0
	A x (B+a)	3 (P3, P5, P5)	3 (P1, P2, P6)	0
Pain	A x B	4 (P2, P3, P4, P5)	2 (P1, P6)	0
	B x a	1 (P1, P4)	4 (P2, P3, P5, P6)	0
	A x (B+a)	2 (P2, P3)	4 (P1, P4, P5, P6)	0
Fatigue	A x B	4 ( P2, P3, P4, P5, P6)	1 (P1)	0
	B x a	1 (P1)	4 (all but P1)	0
	A x (B+a)	5 (P2, P3, P4, P5, P6)	1 (P1)	0
Mindfulness	A x B	3 (P1, P3, P5)	3 (P2, P4, P6)	0
	B x a	2 (P4, P5)	4 (P1, P2, P3, P6)	0
	A x (B+a)	4 (P1, P3, P4 and P5)	2 (P2, P6)	0

Note. A = Baseline; B = Intervention; a = Follow-up; P = participant; P1 = participant 1; P2 = participant 2; P3 = participant 3; P4 = participant 4; P5 = participant 5; P6 = participant 6.

**Table P3**

*Weighted Averages of Data Non-overlap Between Phases for Low Mood and*

	Comparison	Tau	p-value
Low mood	A X B	-0.2733	0.0013**

Anxiety	B x a	-0.1581	0.0434*
	A x (B + a)	-0.3194	0.0001***
	A X B	-0.3493	0.0000***
	B x a	-0.0869	0.2684
Pain	A x (B + a)	-0.3766	0.0000***
	A X B	-0.1749	0.0402*
	B x a	-0.2941	0.0002***
Fatigue	A x (B + a)	-0.2941	0.0029**
	A X B	0.4592	0.0000***
	B x a	-0.1290	0.1000
	A x (B + a)	-0.5197	0.0000***
Mindfulness	A X B	-0.4293	.00000***
	B x a	0.1405	0.0736
	A x (B + a)	-0.4913	.00000***

*Note.* A = Baseline; B = Intervention; a = Follow-up; \* =  $p < .05$ , \*\* = \*\*  $p < .01$ , \*\*\* =  $p < .001$ ,

## Appendix Q

### Standardised Measures Data

**Table Q1**

*Raw Scores for Standardised Measures*

	Measures	T1	T2	T3	T4
P1	HADStotal	18	22	17	13
	HADSA	10	10	10	6
	HADSD	8	12	7	7
	CancerDQoL	-	-4.57	-3.29	-2.7
P2	HADStotal	14	12	9	5
	HADSA	6	5	5	2
	HADSD	8	7	4	3
	CancerDQoL	-	-0.7	-0.63	-1
P3	HADStotal	15	15	5	6
	HADSA	9	7	4	4
	HADSD	6	8	1	1
	CancerDQoL	-	-3.7	-1.9	-
P4	HADStotal	31	28	14	11
	HADSA	19	18	10	6
	HADSD	12	10	4	5
	CancerDQoL	-	-6.95	-5.5	-4.21
P5	HADStotal	31	28	15	-
	HADSA	16	12	8	-
	HADSD	15	16	7	-
	CancerDQoL	-	-4.5	-4.09	-
P6	HADStotal	24	11	15	6
	HADSA	12	5	9	4
	HADSD	12	6	6	2

	CancerDQoL	-	-2.29	-1.43	-0.48
--	------------	---	-------	-------	-------

*Note.* Decrease in scores indicates desired direction of change for HADS. Increase in scores indicates desired direction of change for CancerDQoL. T1 = baseline; T2 = start of intervention; T3 = end of intervention; T4 = follow-up.

**Table Q2**

*RCI Values for HADS overall scores and HADS subscales*

	HADS Total		HADS A		HADS D	
	T1-T2	T1-T3	T1-T2	T1-T3	T1-T2	T1-T3
P1	0.83	2.30*	0	1.68	1.03	2.69*
P2	1.32	2.63*	0.39	1.68	2.00*	4.48*
P3	3.29*	2.96*	1.54	1.68	3.00*	5.37*
P4	4.94*	5.93*	3.47*	5.47*	3.50*	5.37*
P5	4.61*	-	2.32*	-	4.00*	-
P6	.99	3.95*	0	3.78 *	1.50	6.27*

*Note.* HADS A = Anxiety subscale; HADS D = Depression subscale. T1 = average of baseline and start of intervention scores; T2 = post intervention T3 = follow up.

**Table Q3**

*RCI Values for CancerDQoL*

	CancerDQoL	
	T2-T3	T2-T4
P1	1.73	2.29*
P2	0.09	-0.37
P3	2.43*	-
P4	1.96	3.35*
P5	0.55	-
P6	1.16	2.21*

*Note.* T2 = pre intervention scores; T3 = post- intervention; T4 = follow-up; \* $p < .05$ .

## Appendix R

### Process Measure Data

**Table R1**

*MPFI Raw Scores*

	MPFI Global Flexibility			MPFI Global Inflexibility		
	T2	T3	T4	T2	T3	T4
P1	2.45	3.9	4.33	2.66	3.23	2.9
P2	5	4.24	4.8	2	1.9	1.4
P3	3.23	4.48	4.2	3.8	2.03	1.73
P4	3.3	3.97	4.83	3.83	2.99	2.73
P5	2	3.6	-	3.3	2.47	-
P6	3.57	5.07	5.83	3.53	2.2	2.07

*Note.* T2 = pre intervention scores; T3 = post- intervention; T4 = follow-up; \* $p < .05$ . *Note.* Each datapoint on the y axis represents a self-rating on a 0-4 scale (0=not at all, 4=very much so) of how upset and or downhearted participants felt over the last 24-hour period. Each datapoint on the x axis represents at which point in the study the measure was completed.

**Table R2**

*Minimal Detectable Change Index Scores*

	MPFI Global Flexibility		MPFI Global Inflexibility	
	T2-T3	T2-T4	T2-T3	T2-T4
P1	1.45*	1.88*	0.57	0.24
P2	0.76	0.2	0.1	0.6
P3	1.25*	0.97	1.77*	2.07*
P4	0.67	1.53*	0.84	1.1*
P5	1.6*	-	0.83	-

P6	1.5*	2.26*	1.33*	1.46*
----	------	-------	-------	-------

*Note.* \* Achieved reliable change