

Coping with cancer mindfully: A feasibility study of a mindfulness intervention focused on acceptance and meaning in life for adults with advanced cancer[☆]

Fernanda F. Zimmermann^{a,*}, Jennifer Jordan^b, Beverley Burrell^a

^a Centre for Postgraduate Nursing Studies, University of Otago, Christchurch, New Zealand

^b Psychological Medicine, University of Otago, Christchurch, New Zealand

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ABSTRACT

Purpose: The psychological needs of those with advanced cancer have been relatively neglected and many cannot attend treatment for logistic reasons. This study evaluated the feasibility of recruitment and delivery strategies and gathered preliminary data regarding efficacy of the “Coping with Cancer Mindfully” intervention. This is a mindfulness-based intervention designed to improve patients’ coping by accepting their situation, increasing their focus on meaning in life and learning to cope with cancer mindfully.

Methods: This is a single arm pre-post-intervention design. Adults with advanced cancer were recruited from oncology services providers in Christchurch, New Zealand. The intervention was a 1:1 delivery of a 4-week course of pre-recorded mindfulness sessions. Feasibility was assessed by attaining recruitment targets and treatment retention.

Measures: evaluated participants’ levels of mindful coping skills (Mindful Coping Scale), acceptance stance (Acceptance and Action Questionnaire – II) and meaning in their lives (Meaning in Life Questionnaire). Descriptive statistics, paired t-tests and Cohen’s *d* effect sizes were used.

Results: Twenty of 30 eligible participants consented. All participants completed the four-week course, and 19/20 completed post-treatment questionnaires, demonstrating feasibility. Pre-post effect sizes were moderate-large for change in acceptance, large for mindful coping skills and the presence of meaning in life. Pre-post change in search for meaning in life was not statistically significant.

Conclusions: This study presented preliminary promising results regarding efficacy of the intervention in promoting positive changes in acceptance, meaning in life and mindful coping skills. The low-burden and flexible home-based delivery aspects of the intervention contributed to full retention.

1. Introduction

Given the cancer incidence and high mortality (World Health Organization, 2018), the focus on the psychological needs of those with advanced stages of cancer is pertinent, as this population may experience extreme emotional turmoil (Addington-Hall et al., 2009; Bronner et al., 2018; Mitchell et al., 2011).

The advanced stages of cancer are defined as cancers at stage III or IV, consistent with the nomenclature in the AJCC Cancer Staging Manual (Edge et al., 2010) and with numerous studies in this field (Breitbart et al., 2010, 2012, 2015; Ellis et al., 2017; Henry et al., 2010; Lethborg et al., 2012; Lo et al., 2019; Rost et al., 2012). Cancers stage III imply that the tumours are larger, that may have spread (metastases) or

grown more intensely. Stage IV is also termed metastatic or advanced, and means that a primary tumour has spread (American Society of Clinical Oncology, 2018; Edge et al., 2010).

Given the emotional and psychological impact of a life-threatening illness, it is likely then that people with advanced cancer would benefit from learning coping strategies to be able to maintain psychological well-being. A number of psychological interventions have been identified as being potentially beneficial for patients with advanced cancer, including those focusing on coping with cancer (Carlson, 2016; Ellis et al., 2017), enhancing patients’ dignity (Chochinov, 2002; Chochinov et al., 2005, 2011; Julião et al., 2013; Passik et al., 2005), on increasing a sense of peace and meaning in patients’ lives (Breitbart and Poppito, 2014; Gibson et al., 2006; Greenstein and Breitbart, 2000; Hales et al.,

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* Corresponding author. Centre for Postgraduate Nursing Studies, University of Otago, Christchurch. PO Box 4345, Christchurch, 8140, New Zealand.

E-mail address: fernanda.zimmermann@postgrad.otago.ac.nz (F.F. Zimmermann).

2015; Lo et al., 2014; Nissim et al., 2012; Rodin et al., 2018), or the use of mindfulness intervention for stress reduction (Kabat-Zinn, 1990; Santorelli, 2014).

Mindfulness has been described as a type of meditation that cultivates the ability to be in the present moment in an accepting and non-judgmental way (Kabat-Zinn, 2004). Mindfulness is widely used in psychological interventions within clinical settings, while there is increasing acceptance that people with cancer are likely to benefit from this type of interventions, there is a gap in research with the advanced cancer population. This gap is could be related to the difficulty in conducting research in this particularly vulnerable group with compromised health, which affects their recruitment, assessment and retention in studies (Addington-Hall et al., 2009). There appear to be few intervention studies with advanced cancer populations, potentially due to ethical, methodological, and logistical issues (Zimmermann et al., 2018). Not all of the above interventions are easily accessible for this population. Ethical considerations in this particularly vulnerable group are clearly a major barrier to research (Agrawal, 2003; Reyna et al., 2009), with causes of attrition including loss to follow-up, deterioration in health and participants' death (Serfaty et al., 2019).

In this context, this study investigated an easily accessible, low-burden intervention where patients with advanced cancer can obtain new coping skills to help them to cope better with the disease course, facilitating adaptation to their current situation. We developed the "Coping with Cancer Mindfully" (CCM) intervention, specifically to be used independently by people with advanced cancer at home. The aims of this feasibility study was to 1) evaluate the feasibility of the recruitment strategy used for this study, and 2) to gather preliminary data regarding the delivery and efficacy of a novel Mindfulness-Based Intervention (MBI) package, in improving patients' mindful coping skills, acquiring an acceptance stance and reflections about meaning in life, comparing pre-post-test using quantitative method. The decision to include the topics of mindfulness, acceptance, and meaning in life in the CCM intervention were supported by the principal investigator's experience working with patients and by the literature (Breitbart et al., 2012; Carlson and Speca, 2010; Frankl, 1959/1992; Hayes et al., 1999; Kabat-Zinn, J., 2013a,b; Rosenfeld et al., 2016; Steger et al., 2006).

2. Methods

2.1. Research design

The single group pre-post-intervention study design is considered appropriate for the first application of the CCM intervention to establish feasibility of a novel treatment package and to collect preliminary data regarding the intervention's efficacy.

This feasibility study design intends to establish the willingness and effectiveness of clinicians to recruit participants; the number of eligible patients; the characteristics of the proposed outcomes measures; response rates to questionnaires, adherence/compliance rates; the availability of data needed, the utility and restrictions of this particular data set, and the time required for data collection (National Institute for Health Research, 2015); as well as to report effect sizes for pre-post outcomes measures.

2.2. Sample

We aimed to recruit 30 and obtained 20 participants who completed the study, the dropout rate sat within common parameters (between 24% and 40%) which are typical in this kind of study (Chambers et al., 2012; Chambers et al., 2017; Cheung et al., 2017; Rost et al., 2012; Tsang et al., 2012). Small sample sizes which are adequate for feasibility studies are not expected to generate statistically significant results unless population effect sizes are likely to be large (Hertzog, 2008). All participants were adults, aged 18 years or more, had a diagnosis of advanced cancer (stage III or IV), had a clear understanding of written

and spoken English, with an estimated life expectancy of at least four months. People were excluded if they had severe neurological and auditory impairment, hospitalization, acute exacerbation of illness, or current acute psychiatric disorders.

2.3. Procedures

Participants were recruited from the public hospital oncology services and other cancer-related service providers in Christchurch, New Zealand.

Potential participants were screened by an Oncology Research Nurse, and if they were interested, they were contacted by the principal investigator and provided with an information sheet and then once consented completed the pre-intervention questionnaires. Participants were given a choice of having the CCM intervention delivered in the researcher's office or in their homes. Post-treatment data were collected one-week post-intervention.

Data collection started in November 2016 and ended in January 2018 (a 14-month period).

Ethical approval was obtained from the New Zealand Health and Disability Ethics Committee (16/NTA/75).

2.4. Intervention

The CCM intervention was an adapted brief mindfulness-based program utilizing core principles of Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, J., 2013a,b). The design, methodology and some aspects of the CCM intervention delivery were designed to be low burden and intensity, taking into account ethical issues and practical limitations related to their health conditions (Cook, 2012; Flakerud and Winslow, 1998).

The CCM intervention comprises four mindfulness sessions of approximately 20 min each. All four CCM sessions contain guided meditation (with breathing and relaxation techniques). The core of the first session is the body scan technique to increase awareness and focus on the present moment and on mindful coping skills, these strategies were drawn from the MBSR program (Kabat-Zinn, J., 2013a,b). The second session includes some elements of Acceptance and Commitment Therapy (ACT) (Hayes et al., 1999), such as the concept of acceptance, it emphasizes reflections about acceptance through mindfulness practice, in order to facilitate this population gaining psychological flexibility, which is the core component of the ACT model, that integrates mindfulness and acceptance with values and how people behave according to these chosen values, committed actions (Hayes, 1994; Hayes et al., 1999; Hayes et al., 2012). The third session induces reflections about meaning in life through mindfulness practice. The concept of meaning in life in the current intervention study is underpinned by the existentialist position of Steger et al. (2006) and Frankl (1959/1992); that is, meaning is something subjective to each person. The meaning in life aspects of the CCM were inspired by Meaning-Centred Therapies (Breitbart and Masterson, 2016) (Rosenfeld et al., 2016) (Lethborg et al., 2012), and the Dignity Therapy (Chochinov et al., 2005). The fourth session concludes with mindfulness of breath and body sensations, mindfulness of thoughts and feelings, reflections about meaning in life, and the practice review for further self-management of the assimilated coping skills. In this session, participants are guided to consider sources of meaning they have experienced in their life, connecting with life through reflecting on love and nature (Breitbart and Masterson, 2016; Breitbart et al., 2012; Frankl, 1959/1992).

All participants were invited to have a support person with them during this intervention study if they wished. The CCM sessions were conducted on a one-to-one basis, delivered to participants with the principal investigator present, for four consecutive weeks. Sequential sessions were provided to participants each week with free choice for home-practice of the pre-recorded sessions if they wished. CCM session content was provided to participants in a password protected podcast

format, on compact discs (CDs), or memory sticks.

The CCM facilitator was a clinical psychology graduate (Br), trained in MBSR, with three years of experience working with hospice patients and family members.

2.5. Measurements

The questionnaires were streamlined to be low-burden, considering the vulnerability and compromised health of this group. Three short questionnaires (total number of 30 questions) evaluated participants' levels of mindful coping skills, acceptance stance and meaning in their lives.

2.5.1. Mindful coping skills

The Mindful Coping Scale – MCS, is a 23 item scale that assess four facets of mindful coping: awareness, constructive self-distraction (CSD), preventing negative emotions and constructive self-assertion (Tharaldsen and Bru, 2011). The MCS was adapted for this study with the permission of the original authors to meet the needs of the advanced cancer sample context - only two mindful coping subscales were used: awareness (six items), and CSD (seven items). As the other two subscales were not covered in the CCM intervention, they were dropped to reduce measurement burden to participants.

The MCS as used here included 13 items (Awareness subscale and CSD subscale), items were rated using a 5-point Likert scale, rated from 1 (*never/almost never*) to 5 (*always*). A high score on the MCS awareness subscale means high levels of mindful awareness, indicating that participants are more aware of, or paying more attention to their present moment experiences, and high levels of CSD subscale indicates that participants are using their senses (smelling, vision, touching, tasting, hearing) to create new emotions in order to get through difficult moments in their lives. Psychometric data for the MCS as reported by the original authors indicates satisfactory reliability for measuring mindful coping skills with Cronbach's alphas ranging from .76 to .85 for the different MCS-subscales of awareness and CSD respectively (Tharaldsen and Bru, 2011).

2.5.2. Acceptance stance

The Acceptance and Action Questionnaire-II (AAQ-II) assesses the extent to which participants have psychological flexibility or an acceptance stance. It is a single factor 7-item questionnaire (Bond et al., 2011). Each item is rated on a 7-point Likert scale ranging from 1 (*never true*) to 7 (*always true*). A high score on the AAQ-II means a low level of acceptance, that is, it is related to poor acceptance, with experiential avoidance or psychological inflexibility (Bond et al., 2011). Psychometric data for the AAQ-II was provided by the original authors with mean Cronbach's alpha coefficient of .84 across six samples, and three and 12-month test–retest reliability it was .81 and .79 respectively, demonstrating high reliability (Bond et al., 2011).

2.5.3. Meaning in life

The Meaning in Life Questionnaire (MLQ) comprises 10 items assessing the presence of, and search for meaning in life (Steger et al., 2006). Each item is rated on a 7-point Likert scale with ratings 1 (*absolutely untrue*) to 7 (*absolutely true*). High scores on the MLQ-Presence subscale are positive, representing high presence of meaning in life. High scores in the MLQ-Search subscale represent that the person is still searching for meaning in life and low search means that they are not currently looking for meaning. Interpretation of the search subscale needs to be considered in relation to the presence of meaning in life subscale.

Cronbach's alpha reported by the original authors for the MLQ-Search subscale was .84, and the one-month test–retest reliability was .73, indicating adequate reliability (Steger et al., 2006). For the MLQ-Presence subscale, the alpha coefficient was .81 (high reliability) at time-1, with adequate one-month test–retest stability ($\alpha = 0.70$)

(Steger et al., 2006).

Given issues raised in a study related to potential problems with the reversed Item 9 in the MLQ - Presence subscale, researchers suggested that this item should be removed from the scale (Schutte et al., 2016). In consideration of that recommendation, in the current study, sensitivity analyses were conducted in relation to this potential problem, using the 5-item original MLQ-Presence (with Item 9 reversed), Cronbach's alpha of .82 indicated excellent reliability, however if Item 9 was removed, the Cronbach's alpha improved to .90. Given this result and the psychometric issues raised earlier, all subsequent analysis for the MLQ-Presence subscale omitted Item 9.

2.6. Assessment

Participants were evaluated at two time-points: baseline (immediately after written consent) and at one-week post-intervention.

2.6.1. Statistical analysis

Participants' clinical characteristics, demographics, and questionnaires responses at pre and post-intervention were summarised using descriptive statistics. Quantitative data analyses were performed using the Statistical Package for the Social Science (SPSS, Version 24.0 for Macintosh; IBM Corp).

Cohen's *d* effect sizes are reported with 95% confidence intervals. The level of statistical significance was set at $p < .05$. Correlations were Pearson's *r* for normally distributed variables and Spearman's rank order correlation where distributions were skewed.

Paired t-tests were used to calculate the pre-post change scores for the self-report measures: the AAQ-II and for subscales of each of the two measures (MCS and MLQ).

Both completer and Intention to Treat (ITT) analyses are reported for the pre-post analyses. With the small sample size, it was acknowledged that it may be unlikely to find statistically significant differences on the outcome measures but the study would establish effect sizes.

3. Results

3.1. Recruitment and treatment completion

Fig. 1 illustrates the flow of recruitment and participation in the study.

Thirty eligible potential participants were referred to the study, however only 20 entered the study, with five potential participants declined enrolment and another five did not respond to attempts to contact them.

All participants elected to have the intervention delivered in their homes, however during the CCM intervention, three participants were admitted to a hospice for palliative care due to rapid health deterioration. All three participants wanted to finish the treatment, and with participants' consent and assent of their families, the CCM final sessions were delivered to them in the hospice.

Twelve (60%) participants had a support person (mostly spouses) with them during one or more of the CCM sessions. The feasibility of delivering the CCM intervention to adults with advanced cancer was demonstrated by 100% completing the four sessions, with 19/20 (95%) post-treatment questionnaires completed. One participant was too ill to complete the post-questionnaires.

3.2. Characteristics of the sample

Table 1 presents participants' demographic and cancer characteristics.

The mean age of the sample was 55.6 years ($SD = 12.9$), three quarters of the sample were female, and ethnic identification was: New Zealand (NZ) European (70%), one participant was Māori and four participants (20%) of other ethnicity (Non-NZ born European & Middle

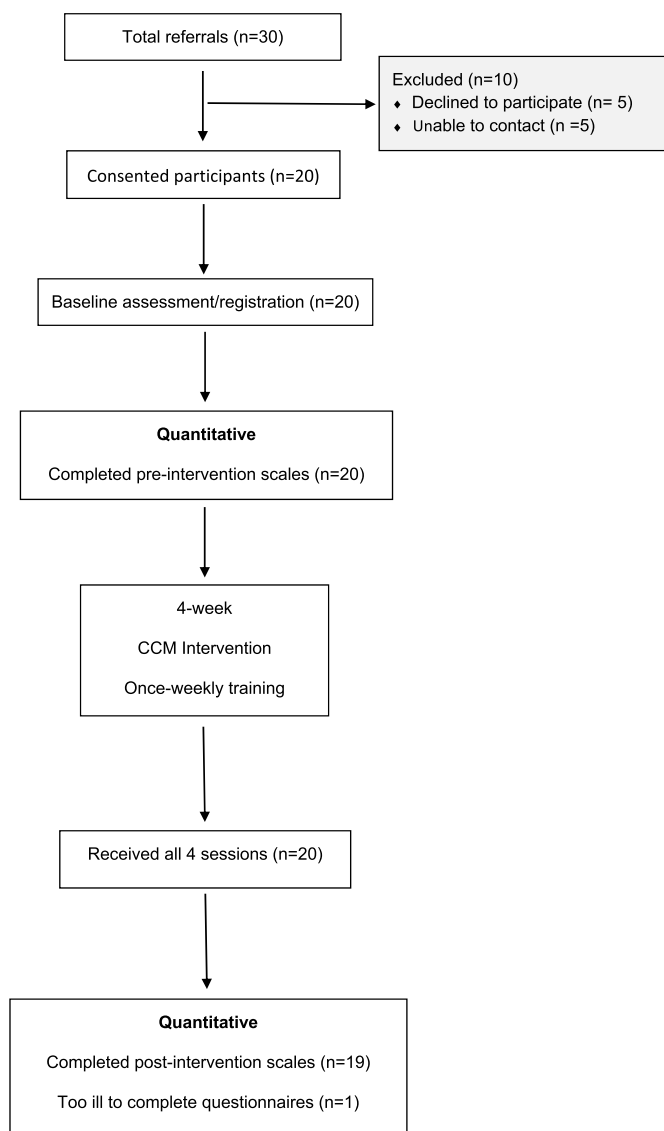


Fig. 1. Enrolment flowchart.

Eastern ethnicities). The most common cancer types were bowel cancer (20%), breast (15%), and lung (10%).

At baseline, the majority of the participants (85%, n = 17) had no prior experience of mindfulness meditation, two participants (10%) reported that they had practised mindfulness meditation in the past, and one participant (5%) reported practising mindfulness meditation currently.

3.3. Pre-post questionnaires

Table 2 presents the pre and post scores and effect sizes for each of the questionnaire variables.

3.3.1. Acceptance stance

Both pre and post AAQ-II scores were skewed, however, means and SDs are presented in the table for ease of interpretation. Given the skewed distributions though, the pre-post analysis was re-run using the Wilcoxon signed-rank test for dependent samples and the results remained statistically significant. For the completer analysis, there was a moderate to large effect size ($d = 0.75$) pre-post reduction in AAQ-II scores (meaning increased levels of acceptance) with a statistical significance level of $p < .01$.

Table 1
Participants' demographic and cancer characteristics.

| Characteristics | N | (%) |
|-----------------------------------|----|-----|
| Gender | | |
| Male | 5 | 25 |
| Female | 15 | 75 |
| Age | | |
| 30-40y | 3 | 15 |
| 41-50y | 2 | 10 |
| 51-60y | 8 | 40 |
| 61-70y | 5 | 25 |
| 71-80y | 2 | 10 |
| Race/Ethnicity | | |
| New Zealand European | 14 | 70 |
| Māori | 1 | 5 |
| Cook Island Māori | 1 | 5 |
| Other (European & Middle Eastern) | 4 | 20 |
| Marital status | | |
| Not in a relationship | 1 | 5 |
| Married | 15 | 75 |
| Divorced | 1 | 5 |
| Widowed | 2 | 10 |
| Separated | 1 | 5 |
| Living situation | | |
| With family | 18 | 90 |
| Other | 2 | 10 |
| Education Level | | |
| Primary | 1 | 5 |
| Secondary | 9 | 45 |
| Tertiary | 7 | 35 |
| Postgraduate | 3 | 15 |
| Working status | | |
| Currently working | 6 | 30 |
| Not working | 14 | 70 |
| Cancer stage | | |
| III | 6 | 30 |
| IV | 14 | 70 |

3.3.2. Mindful coping skill of awareness

For the completer analysis, there was a large effect size ($d = -.95$) pre-post increase in MCS-Awareness scores with a statistical significance level of $p < .001$.

3.3.3. Mindful coping skill of CSD

For the completer analysis, there was a large effect size ($d = -.94$) pre-post increase in MCS-CSD scores with a statistical significance level of $p < .001$.

3.3.4. Meaning in life (presence of meaning)

For the completer analysis, there was a moderate to large effect size ($d = -.79$) pre-post increase in MLQ- Presence scores, with a statistical significance level of $p < .01$.

3.3.5. Meaning in life (search for meaning)

For the completer analysis, there was a small effect size ($d = 0.24$) pre to post reduction in MLQ-Search scores which was not statistically significant ($p = .24$). Given the skewed distributions though, the pre-post analysis was re-run using the Wilcoxon signed-rank test for dependent samples. The results were unchanged. At post-intervention 47% of the participants decreased their search for meaning in life.

4. Discussion

The current feasibility study was designed to evaluate the feasibility of the recruitment strategy used and to gather preliminary data regarding the delivery and efficacy of the CCM intervention in improving participants' mindful coping skills, acceptance stance, and meaning in life. This study delivered an original targeted intervention package that integrated the three core concepts of mindfulness, acceptance and meaning in life into a low-intensity, low-burden intervention.

Table 2

Pre-post effect scores for mindful coping skills, acceptance and meaning in life measures following the CCM intervention using completer (n = 19) and intention to treat analyses (n = 20).

| Measure/subscales | Type of analysis | Pre CCM \bar{x} (SD) | Post CCM \bar{x} (SD) | Change [CI] \bar{x} (lower - upper) | Pre-post effect size | Magnitude |
|---|--------------------|------------------------|-------------------------|---------------------------------------|----------------------|----------------|
| Acceptance and Action | | | | | | |
| Questionnaire II (AAQ II) | | | | | | |
| | Completer analysis | 20.74 (SD = 10.35) | 15.16 (SD = 7.03) | 5.30 (1.59–9.01) | $d = 0.75^{**}$ | Moderate-large |
| | ITT analysis | 20.80 (SD = 10.08) | 15.50 (SD = 7.02) | 5.30 (1.59–9.01) | $d = 0.71^{**}$ | Moderate-large |
| Mindful Coping Scale (MCS) | | | | | | |
| Awareness subscale | | | | | | |
| | Completer analysis | 17.37 (SD = 4.79) | 23.47 (SD = 4.46) | -5.80 (-8.80--2.80) | $d = -0.95^{***}$ | Large |
| | ITT analysis | 17.20 (SD = 4.74) | 23.01 (SD = 4.83) | -5.80 (-8.80--2.80) | $d = -0.98^{***}$ | Large |
| Constructive Self-distraction subscale | | | | | | |
| | Completer analysis | 16.89 (SD = 6.39) | 22.32 (SD = 5.78) | -5.15 (-7.85--2.44) | $d = -0.94^{***}$ | Large |
| | ITT analysis | 17.25 (SD = 6.43) | 22.40 (SD = 5.64) | -5.15 (-7.85--2.44) | $d = -0.90^{***}$ | Large |
| Meaning in Life Questionnaire (MLQ) | | | | | | |
| MLQ-Presence of meaning subscale (without Item 9) | | | | | | |
| | Completer analysis | 18.47 (SD = 7.58) | 24.74 (SD = 3.45) | -6.26 (-9.72--2.80) | $d = -0.99^{**}$ | Large |
| | ITT analysis | 18.45 (SD = 7.38) | 24.40 (SD = 3.68) | -5.95 (-9.28--2.61) | $d = -0.92^{***}$ | Large |
| MLQ-Search for meaning | | | | | | |
| | Completer analysis | 13.79 (SD = 7.89) | 11.26 (SD = 7.83) | 2.40 (-2.32-7.12) | $d = 0.24$ | Small |
| | ITT analysis | 13.80 (SD = 7.68) | 11.40 (SD = 7.64) | 2.40 (-2.32-7.12) | $d = 0.24$ | Small |

CCM: Coping with Cancer Mindfully; CI: Confidence Intervals; SD: Standard Deviation; d : Cohen's d effect size; ITT: Intention-To-Treat (n = 20); * $p < .05$; ** $p < .01$; *** $p < .001$.

Characteristics of the CCM intervention such as the low burden assessment and easy accessibility of treatment through home delivery, individual format, availability of different audio formats for session delivery, following each participants' pace, and a relatively short treatment duration (one month), are elements that may have contributed to all participants completing of the CCM treatment modules. Similarly, home-delivery intervention studies targeting advanced cancer patients reported high adherence and more suitability, considering the patients' health conditions (Chochinov et al., 2005; Henry et al., 2010; Molassiotis et al., 2018), and from the patients' perspective, the home-delivery format was viewed as very convenient (Passik et al., 2005).

All but one participant completed the end-point questionnaires (95% completion rate). Such high adherence is not common in intervention studies with vulnerable populations like patients with advanced cancer, reasons for high attrition in other studies are likely to be related to factors such as group format interventions which pose logistical barriers that affect participants' ability to attend the sessions (Breitbart et al., 2015), participants face travel issues, the treatments often clashed with the frequent other health appointments, common in this relatively unwell group, and to a number of MBIs been relatively long in length (Zimmermann et al., 2018). Retention issues are also related to participants being too ill to join a study (Chochinov et al., 2011; Stewart, 2014) as their physical health decline or even to participant deaths during a study (Cook, 2012; Lo et al., 2014; Serfaty et al., 2019). High attrition has affected the field in that only a minority have sufficient participants at end of the treatment for viable statistical analyses (Beatty et al., 2018).

The potential for short duration, low-burden MBIs to be effective has been supported by a recent study with 153 stressed adults, that found two weeks of mindfulness training was sufficient time to develop acceptance skills to reduce the impact of stress in participants (Lindsay et al., 2018).

The recruitment strategy used was considered feasible, with the target of 20 participants being met. This study's sample size is small from a statistical aspect, it is considered acceptable for feasibility or pilot studies however, which are expected to be underpowered to detect statistically significant differences. A small sample size is appropriate where the intervention has not been trialed previously, as was the case with the CCM intervention. In fact, the results indicate that changes were sufficiently large to detect statistically significant pre-post differences in four of the five variables evaluated in this study.

Enlisting the support of the Oncology Research Nurse in referring potential participants to the CCM intervention was an effective strategy, with 65% of the participants being recruited from the Oncology Research Nurse's referrals, all of whom were eligible. The choice to request the oncology nurse to collaborate on this research recruitment is supported by a recent study with 345 US cancer survivors, where participants reported that their most preferred source of learning about psychological support was via their medical oncologists followed by their oncology nurses (Arch et al., 2018).

This study provided preliminary evidence of the effectiveness of the CCM intervention in improving participants' mindful coping skills, acceptance stance and presence of meaning in life while around half of the participants reported that the search for meaning in life was reduced. The pre-recorded sessions provide a standardized intervention which will allow research replication of the intervention. The standardized delivery aspect of the CCM has the potential for ease of delivery of the intervention if included as part of routine healthcare delivery. Although the one-to-one format and home delivery elements are more expensive than the costs of running a group in a hospital setting, the costs of materials in the CCM are minimal (all participants used their own devices and mostly accessed the podcast version) and the brief intervention format makes it a relatively cost-effective intervention for clinically significant improvements in psychological wellbeing for these patients in the terminal phase of their illness. Most importantly, this delivery method reached these participants.

There were several limitations to this study. The open-label pre-post design and small sample size for the quantitative aspect, although appropriate for this feasibility study, limit the conclusions that can be drawn about the promising changes observed, as does the lack of a control group. As such, these findings need to be considered preliminary and require replication in a randomised controlled trial (RCT). In addition, the lack of follow up in the current study is a limitation, as it is unknown whether the positive changes observed were maintained.

One participant was already using mindfulness prior to participating in the current study, demonstrating a high level of mindful coping skills at baseline, however at post-intervention she also demonstrated positive changes on key measures.

Unlike the other measures, the search for meaning in life subscale was complicated to interpret as the valence of the meaning of searching for meaning in life depended on the level of presence of meaning in life. For example, if presence of meaning in life is low, searching is adaptive whereas failure to search could be a sign of hopelessness. In contrast,

where there is already high presence of meaning in life, both searching continued openness) and no longer search (at peace) could both be seen as positive. Further development is needed on the search for meaning in life subscale to take these different meanings into account.

5. Further research recommendations

This small study presented promising preliminary results for this mindfulness intervention. Further research with a larger sample is needed to establish whether the positive preliminary findings can be replicated in a RCT. Further CCM research could examine the impact on family members or support persons of the patient participating in the CCM intervention, to establish whether they also benefit indirectly, as has been suggested in previous research with MBIs. Future studies could also address the extent and type of training and experience needed to implement the CCM intervention. If a wider range of health workers could be trained to deliver the intervention, this has the potential to improve its cost-effectiveness and the ability to reach this vulnerable population. Future consideration is given to investigate the efficacy of the CCM as a guided self-help intervention delivered with phone, email or messaging support to address scalability issues.

6. Conclusions

The current study presented promising preliminary results for this original package of a mindfulness-based intervention (CCM) at assisting patients with advanced cancer to better cope with their illness by acquiring and/or improving mindful coping skills, by accepting their situation and increasing their focus on meaning in life. This study's feasibility findings also suggest that the logistical difficulties contributing to low adherence and high dropout in research projects on interventions with this advanced cancer population could be much improved with the implementation of more patient-centred modes of delivery, that is, with low-burden assessments, low-intensity, and flexible delivery options responsive to the needs of these patients as their health deteriorates.

Declaration of competing interest

None declared.

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