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# *Truce*: Outcomes and mechanisms of change of a seven-week acceptance and commitment therapy program for young people whose parent has cancer

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## ABSTRACT

*Truce* is an Acceptance and Commitment Therapy group program for young people who have a parent with cancer. In a pragmatic controlled trial, we compared *Truce* with a wait-list condition to assess its effect on unmet needs and distress. We also investigated how process variables—mindfulness, cognitive inflexibility, family functioning, and life events—might influence outcomes. Participants' unmet needs improved over time ($\hat{\beta} = -5.01$, $SE = 16.48$, $p = 0.036$, effect size = 0.42), and those improvements were greater for the intervention group compared to controls ($\hat{\beta} = -5.03$, $SE = 2.41$, $p = 0.040$, effect size = 0.29). There was no evidence of a significant program benefit for distress. For the intervention group, greater improvements in unmet needs were associated with higher baseline distress ($t = 2.36$, $df = 47$, $p = 0.022$), and being less mindful at baseline ($t = 2.07$, $df = 47$, $p = 0.044$). No significant mediators were identified. For the control group only, experiencing negative/mixed life events related to cancer was a significant moderator of improvement ($t = -2.36$, $df = 33$, $p = 0.024$). *Truce* appears to offer therapeutic benefits to young people who have a parent with cancer, over and above the expected adjustment to the situation over time. The program seems to buffer the impact of negative cancer-related life events on participants' well-being, but the mechanisms of change remain unclear.

## 1. Introduction

A parent's cancer diagnosis can cause extensive disruption across multiple domains of an adolescent or young adult's (AYA, 12–24 years) life, including mental health, family relationships, friendships and peer socialisation, and personal development (Morris et al., 2016; Tanner & Arnett, 2016; Walczak et al., 2018; Wray et al., 2022). For example, parents may be absent or less available due to treatment or caregiving demands, meaning they are less able to spend time with or care for their children; offspring, who take on additional caregiving and household responsibilities while the family adjusts to the parent's sickness, may find this leaves less time for studying, working, or socialising with friends; and desires to spend more time with the family during this difficult period can influence educational and career decisions, and may delay the progression to independence and identity development (Clemens, 2009; Nicholls et al., 2017; Patterson et al., 2017; Visser et al., 2004; Walczak et al., 2018; Wray et al., 2022). Families often find it difficult to communicate about parental cancer: parents may be uncertain about how best to inform children about the cancer (including how to manage their emotional reactions) and may underestimate their children's information needs, while both parents and children have reported withholding their emotional reactions to avoid distressing or burdening each other (Lewis et al., 2020; Morris et al., 2018; Semple & McCance, 2010; Shands & Lewis, 2021). This may leave AYAs

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underinformed about their parent's health, treatment and prognosis, which can perpetuate misunderstandings, distress and anxiety (Alexander et al., 2023; Cho et al., 2015; Ellis et al., 2017; Kennedy & Lloyd-Williams, 2009; Morris et al., 2016; Perak et al., 2024; Phillips & Lewis, 2015; Wong et al., 2009).

Social support has been identified as a protective factor for offspring impacted by parental cancer, including support from family, friends, teachers, religious/spiritual communities, and peers with similar experiences (Clemens, 2009; Morris et al., 2018; Tulpin et al., 2024). However, AYAs often receive inadequate support in adapting to the cancer situation: unmet needs are common, particularly for support from friends (Karlsson et al., 2013; Maynard et al., 2013; Patterson et al., 2011; Torp et al., 2013) and from peers in similar situations who understand their experiences (Maynard et al., 2013; McDonald et al., 2020; Patterson et al., 2011, 2017). For example, extended family may focus on the well-being of the parent with cancer, overlooking offspring support needs (Tulpin et al., 2024); friends may not know how to talk about or provide support regarding parental cancer (Maynard et al., 2013); schools and healthcare systems may be ill-equipped to support offspring (Bergersen et al., 2022; Finch & Gibson, 2009); and it may be difficult to locate and connect with other AYA offspring (Tulpin et al., 2024). AYAs also report unmet needs for recreation and time away from the immediate cancer situation to help them manage the emotional impact of the cancer situation (Maynard et al., 2013; Patterson et al., 2011; Tulpin et al., 2024). Resources supporting families are similarly lacking: few high-quality information resources are available to support parents with cancer who have AYA children, and those which exist do not comprehensively address the unique needs of AYA offspring or provide any specific information about supporting young adult offspring (Weeks et al., 2019). Consequently, AYAs affected by parental cancer report higher rates of distress, internalising and externalising problems, stress, and isolation (McDonald et al., 2016; Morris et al., 2016; Thastum et al., 2008; Walczak et al., 2018; Wray et al., 2022).

Given their unique challenges and needs, a growing body of literature has outlined the development and evaluation of therapeutic interventions for young people affected by parental cancer (see Walczak et al., 2018). This includes: a group adventure program for children and adolescents (Tucker et al., 2013); a supportive-educational program for adolescents (Azarbarzin et al., 2015); an inpatient program for mothers and children (John et al., 2013); family counselling and support services (Bugge, Helseth, & Darbyshire, 2008; Bugge et al., 2009; Schmitt et al., 2007); and culturally-adapted group family programs (Davey et al., 2013; Kobayashi et al., 2017). While program formats vary, their aims typically centre around improving family functioning; supporting (or preventing deterioration of) psychological well-being; and fostering peer connection and respite. These programs have shown promise in providing time away from the immediate cancer situation and peer connection (Tucker et al., 2013), improving family communication (Bugge et al., 2008; Bugge et al., 2009; Davey et al., 2013), and improving psychological well-being (Azarbarzin et al., 2015; John et al., 2013; Kobayashi et al., 2017). However, few programs have identified a specific therapeutic approach guiding the program, and details of the content, structure and evaluation are often limited (Alexander et al., 2019; Ellis et al., 2017; Ohan et al., 2020; Walczak et al., 2018). Much of this literature is qualitative or descriptive, relies on unvalidated measures, or only measures outcomes immediately after the program (Alexander et al., 2019). These methodological choices make it difficult to identify if the impacts of the programs were statistically significant, whether they were maintained over time, and what aspects of the programs contributed to their impacts. It is also unclear which therapeutic approaches are the most effective.

Acceptance and Commitment Therapy (ACT) is increasingly being applied in the cancer context (González-Fernández & Fernández-Rodríguez, 2019; Hulbert-Williams et al., 2015; H. Li, Wong, et al., 2021). ACT focuses on the process of psychological flexibility, which promotes the acceptance of all mental events and the pursuit of values-consistent living, rather than attempting to eliminate difficult emotions (Hayes et al., 1999, 2006). In the context of chronic or serious illnesses, it may be more adaptive to allow rather than avoid realistic but potentially distressing thoughts about the disease, such as those relating to illness duration or prognosis. Systematic reviews and meta-analyses of this growing body of literature have demonstrated that ACT is effective across a range of physical and mental health conditions (Gloster et al., 2020), including chronic pain (Feliu-Soler et al., 2018), fibromyalgia (Haugmark et al., 2019), depression (Bai et al., 2020; Coto-Lesmes et al., 2020), anxiety (Coto-Lesmes et al., 2020) and psychosis (Jansen et al., 2020). These benefits have been linked to underlying improvements in psychological flexibility (Stockton et al., 2019). In the adult cancer context, review papers and meta-analyses have identified that ACT interventions are associated with improved psychological flexibility and quality of life, and reduced distress, depression, anxiety and fear of cancer recurrence (Fashler et al., 2018; González-Fernández & Fernández-Rodríguez, 2019; Li, Wong, et al., 2021; Li et al., 2021; Mathew et al., 2021; Zhao et al., 2021). ACT also appears to be effective at managing anxiety and depressive symptoms, disordered eating and chronic pain, and reducing experiential avoidance and cognitive fusion amongst adolescents (Burley & McAloon, 2024; Petersen et al., 2024; Wang & Fang, 2023).

Additionally, ACT appears to be feasible, acceptable, and effective for adolescents impacted by cancer, including those who have completed cancer treatment themselves (Clarke et al., 2021) and those impacted by their own or a parent or sibling's cancer (Patterson et al., 2021, 2022). In the evaluation of these multi-day residential programs, young people found the interventions to be meaningful, relevant and helpful, with those participants who attended Patterson and colleagues' (2021, 2022) program with high or very high levels of baseline distress experiencing clinically significant improvements in psychosocial well-being. Together, this suggests that ACT is a fitting, feasible and effective approach when supporting young people impacted by personal or familial cancer.

Canteen, an Australian not-for-profit organisation supporting AYAs impacted by their own or a family member's cancer, developed the *Truce* program in response to the limited availability and evidence for supportive interventions for AYAs impacted by parental cancer (Allison et al., 2023; Patterson et al., 2015). The program is grounded in ACT and aims to support AYAs to develop the skills needed to maintain their psychosocial well-being in relation to the impacts of cancer and other challenging life events. Group discussions and practice activities are used to introduce key principles of ACT, including: accepting unpleasant thoughts and feelings; cognitive defusion; mindfulness; identifying values; and committing to values-consistent action (Bach & Moran, 2008; Ciarrochi et al., 2012; Hayes et al., 1999). There are seven sessions in total; six are with just the young person, with parents/caregivers also invited to one session, which addresses family communication and shared values. Peer group sharing is encouraged throughout to normalise and validate participants' experiences and facilitate the exchange of coping strategies.

Preliminary evaluation findings have demonstrated the feasibility and acceptability of *Truce* across 21 face-to-face and online groups (Allison et al., 2023). The program was delivered with high fidelity to the manual, with 85–95% of each session's activities delivered as manualised. The majority of AYAs (89%) and parents/caregivers (96%) reported satisfaction with the program, and interest ratings were high (7.5–8.6 out of 10 for AYAs, and 8.8 for parents) across sessions. Almost all AYAs and three-quarters of parents/caregivers agreed that *Truce* helped them to cope with the cancer situation, while qualitative data indicated perceived benefits associated with its therapeutic teachings, peer connection, and parent/caregiver involvement. Some participants reported applying their learnings beyond the immediate cancer experience, and flow-on effects for parent/caregivers and families. However, both participants and facilitators reported some challenges in maintaining participant engagement, particularly given AYAs' competing priorities (e.g. school, work) and other life challenges that occurred during the program (e.g. parent health changes, relationship breakdowns). While the qualitative indicators are promising (Allison et al., 2023), further work is needed to evaluate whether *Truce* produces statistically significant improvements in psychosocial well-being, whether these benefits are maintained over time, and whether changes in therapeutic and/or family processes underlie program effects.

This study aimed to quantitatively assess the impact of *Truce* on participants' unmet needs and psychological distress across three timepoints, relative to a wait-list control group. Additionally, we aimed to investigate whether any changes in unmet needs and distress were moderated or mediated by therapeutic or family process variables. We also examined whether the occurrence of significant life events moderated any changes in unmet needs and distress.

## 2. Methods

### 2.1. Study design

The study was registered with the Australian and New Zealand Clinical Trials registry (ACTRN12615000761561) and approved by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong (HE11-482). It was a pragmatic controlled trial with a 2 group (intervention vs. wait-list control) x 3 repeated measures (pre, post and follow-up) design. Pragmatic trials differ from randomised controlled trials because they focus on evaluating effectiveness (under usual care conditions) rather than efficacy (under ideal circumstances) (Zwarenstein et al., 2008). Initially, if enough participants were recruited in an area to run a group, they were assigned to the intervention condition, while participants recruited without a viable group were assigned to the control condition. When this resulted in a disproportionately low number of control participants, we obtained ethics approval to recruit additional participants for the control condition only.

### 2.2. Participants

#### 2.2.1. Recruitment

Recruitment occurred from 2012 to 2020. The program was advertised via Canteen and other cancer organisations' websites, social media accounts and newsletters; via posters at schools and universities; and to healthcare professionals working with adult cancer patients. The advertisements described *Truce* as a skills-based group program where they could connect with other young people and learn ways to cope with having a parent or caregiver with cancer. Research staff contacted interested participants to discuss the intervention and confirm their eligibility. Informed, written consent was obtained from all participants, and from the parents of those under 18 years.

#### 2.2.2. Eligibility

AYAs were eligible if they were aged 14–22 years and had a parent/caregiver who was receiving treatment for cancer or had been diagnosed with cancer/recurrence in the last five years. Clinical discretion was applied to the age criteria, with some young people permitted participate at 13, or up to 24 years, if their circumstances and maturity were determined to be a good fit for the group. Exclusion criteria were: a) having insufficient English to participate in the program and/or complete the measures; or b) psychiatric/cognitive impairment which would prevent participation. This was determined in consultation with the referring clinician or parent/guardian. Eligible siblings from the same family were permitted to participate and assigned to the same condition (intervention or control).

#### 2.2.3. Sample size

An a priori power analysis was published in the study's protocol paper (Patterson et al., 2015). A medium effect size was assumed, based on the absence of previous studies using the primary outcome measure (Cohen, 1988). It was estimated that 130 participants would be needed to detect a medium effect size (0.5) in a mixed model analysis, assuming 80% power and a significance criterion of alpha = 0.05.

Of the 147 young people consenting to the study, 142 (96.6%) completed the baseline survey, and 101 (68.7%) completed surveys at least twice and were included in the analyses.

#### 2.2.4. Attrition

Fig. 1 shows the number of participants who were retained or dropped out at each stage. Bivariate analyses identified baseline characteristics that differentiated between the analysis sample and those who completed baseline surveys only. Significant predictors were incorporated into a multivariable logistic regression model, while controlling for age and gender (see Supplementary Table 1). Fifteen young people were excluded from the analysis due to missing data, most of whom were unsure whether their parent had relapsed.

The full model was significantly reliable ($X^2 = 17.33$, $df = 6$, $p = 0.008$), but only accounted for 11.7–18.6% of the variance. The only significant predictor in the final model was having a parent who had relapsed (Wald statistic = 8.12, $df = 1$, $p = 0.004$), which increased the odds of dropping out after baseline by a factor of 3.81 (95% CI: [1.52, 9.56]).

#### 2.2.5. Sample description

Table 1 shows characteristics of the intervention group ($n = 55$), control group ($n = 46$) and combined analysis sample. The majority were female (70.3%), and it had been an average of 2.2 years since their parents' most recent diagnosis ($SD = 3.5$). In most cases, the parent with cancer was the participant's mother (72.3%) and was still receiving active or maintenance treatment (62.3%). A substantial minority had one or more siblings participating in the study (36.6%).

### 2.3. Intervention

*Truce* was delivered over seven, weekly, 2-h sessions with groups of 4–10 young people. Sessions progressively introduced ACT concepts (e.g. cognitive defusion, mindfulness, values-consistent actions) to participants, encouraging reflection and discussion on how these principles could be applied in managing day-to-day challenges, and teaching practical exercises that allowed participants to put these concepts into practice (see Table 2). Young people also received a booklet containing review materials and homework exercises. Parents were invited to attend Session 6 with their child and were given a parent booklet containing information about the needs of young people who have a parent with cancer, suggestions for how to help their child, and their own homework exercises. Further details of session content has been published previously (Allison et al., 2023; Patterson et al., 2015).

Groups were conducted in regional and metropolitan settings across five Australian states and territories. Most groups (17) were conducted in person and the remaining four were held via videoconference. Modifications for online groups included: limiting the maximum group size to five; extra guidelines to ensure privacy and minimise distractions; and incorporating audio and video recordings into some activities.

Sessions were facilitated by Canteen staff and external facilitators who had previous ACT training and experience working with young people. Facilitators were given manuals outlining the program's development, content, and conduct, and attended weekly briefing and debriefing sessions to support adherence. An average of 85–95% of each session's activities were reportedly delivered in accordance with the manual (Allison et al., 2023). Copies of the manual are available on request to the authors.

### 2.4. Wait-list control

Wait-list participants received a short book containing medical and

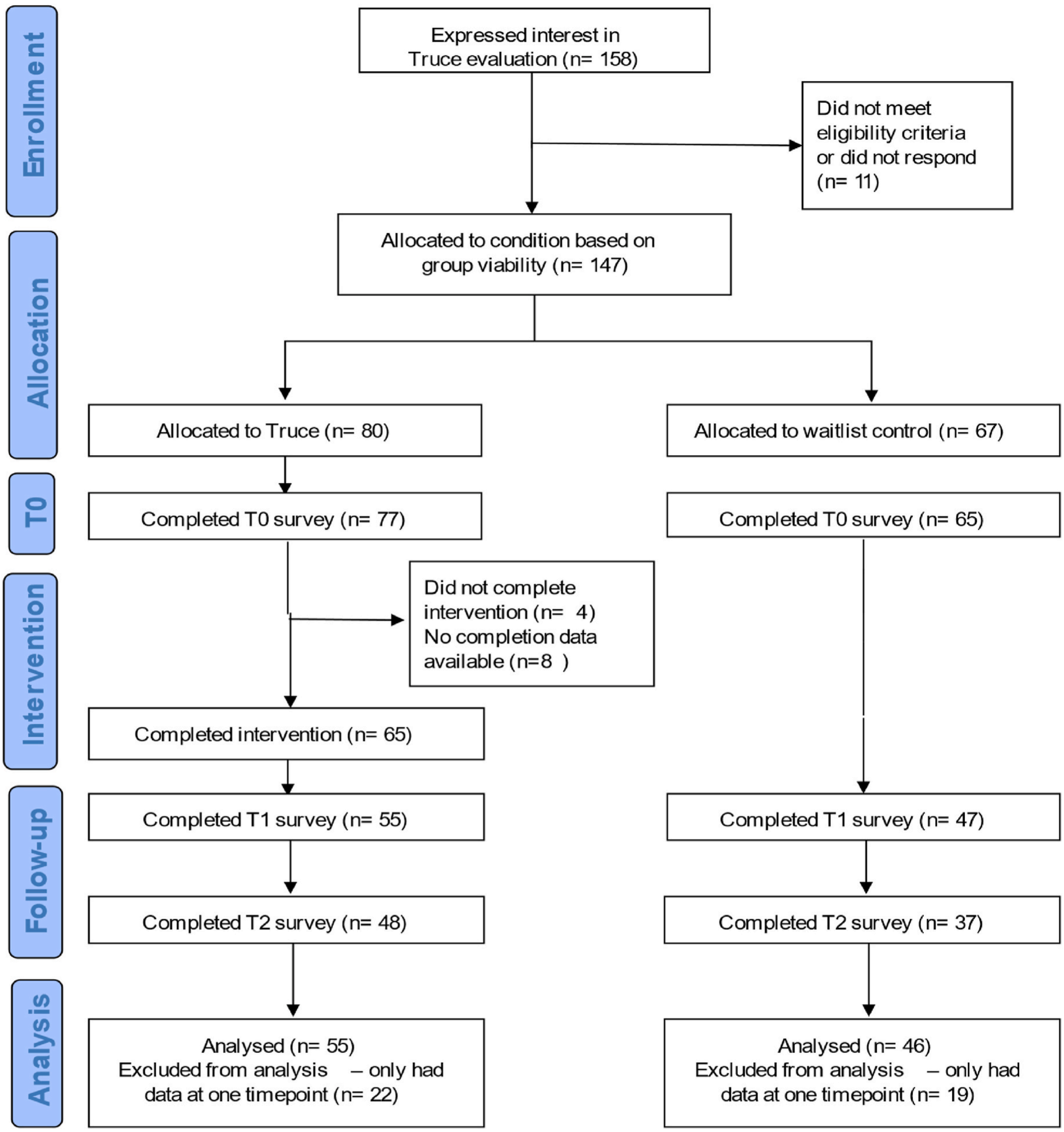

**Fig. 1.** Flow diagram.

psychosocial information about having a parent with cancer and practical coping tips[1] (CanTeen, 2008). They were free to access other support services during the waiting period, including other Canteen programs. They were given the opportunity to attend a *Truce* group after completing the last survey.

### 2.5. Data collection

Data was collected using a mixture of paper and online surveys. For the intervention group, baseline surveys (T0) were completed at the beginning of the first group session, and the first follow-up (T1) was completed at the end of the last group session, approximately seven weeks later. The second follow-up (T2) was sent out two months after T1. Additional fidelity and engagement data were collected at the end of each session (see Table 3). The control group was sent surveys at the same time intervals as the intervention group.

### 2.6. Measures

Table 4 details the outcome measures used in the study. The primary outcome was the Offspring Cancer Needs Inventory (OCNI; Patterson et al., 2013) which measures unmet needs in young people whose parent has cancer. The secondary outcome was the Kessler Psychological Distress Scale (K10; Kessler et al., 2002), which measures psychological distress over the past month. The K10 was originally intended to be a primary outcome measure (Patterson et al., 2015) but was changed to a secondary measure based on indications of a possible floor effect in the baseline data. Visual assessment and normality testing of the baseline data revealed that the K10 data was negatively skewed (skewness = 0.87; Shapiro-Wilk: $p<.001$), with some high scoring outliers. This decision was made prior to conducting any repeated measures analyses.

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[1] The latest version of the book, ‘Now What … ? Dealing with your parent’s cancer’ can be downloaded at www.canteen.org.au/how-we-help/books-resources.

**Table 1**
Demographic and clinical characteristics of participants in the analysis sample.

| Characteristic | Intervention (*n* = 55) | Control (*n* = 46) | Combined (*n* = 101) |
|---|---|---|---|
| | *M (SD)* | *M (SD)* | *M (SD)* |
| Age | | | |
| Age at baseline (years) | 16.84 (2.82) | 17.11 (2.45) | 16.96 (2.64) |
| Age at most recent diagnosis (years) | 14.26 (4.42) | 15.02 (3.20) | 14.61 (3.91) |
| Time since most recent diagnosis (years) | 2.55 (4.20) | 1.78 (2.28) | 2.19 (3.46) |
| Years of Canteen membership | 1.02 (1.60) | 1.29 (1.53) | 1.14 (1.57) |
| Time between surveys | | | |
| T0-T1 (weeks) | 7.53 (2.20) | 11.21 (3.51) | 9.12 (3.37) |
| T1-T2 (weeks) | 13.83 (6.25) | 9.96 (4.58) | 12.17 (5.89) |
| | *n* (%) | *n* (%) | *n* (%) |
| Gender | | | |
| Female | 37 (67.3) | 34 (73.9) | 71 (70.3) |
| Male | 18 (32.7) | 12 (26.1) | 30 (29.7) |
| Cultural background | | | |
| Born in Australia[a] | 48 (87.3) | 42 (91.3) | 90 (89.1) |
| Aboriginal/Torres Strait Islander descent | 1 (1.8) | 0 | 1 (1.0) |
| Speaks language(s) other than English at home[b] | 6 (10.9) | 4 (8.7) | 10 (9.9) |
| SES quartile[c] | | | |
| 1 (lowest) | 11 (20.0) | 2 (4.4) | 13 (12.9) |
| 2 | 5 (9.1) | 13 (28.3) | 18 (17.8) |
| 3 | 13 (23.6) | 5 (10.9) | 18 (17.8) |
| 4 (highest) | 25 (45.5) | 25 (54.3) | 50 (49.5) |
| Missing | 1 (1.8) | 1 (2.2) | 2 (2.0) |
| Accessibility Remoteness Index of Australia[d] | | | |
| Major city | 42 (76.4) | 34 (73.9) | 76 (75.3) |
| Inner regional | 9 (16.4) | 3 (6.5) | 12 (11.9) |
| Outer regional | 3 (5.5) | 6 (13.0) | 9 (8.9) |
| Missing | 1 (1.8) | 3 (6.5) | 4 (4.0) |
| Currently studying | | | |
| School | 38 (69.1) | 29 (63.0) | 67 (66.3) |
| TAFE/college | 2 (3.6) | 1 (2.2) | 3 (3.0) |
| University | 8 (14.6) | 8 (17.4) | 16 (15.8) |
| Currently employed | | | |
| Full time | 3 (5.5) | 3 (6.5) | 6 (5.9) |
| Part time | 3 (5.5) | 3 (6.5) | 6 (5.9) |
| Casual | 10 (18.2) | 16 (34.8) | 26 (25.7) |
| Voluntary/unpaid | 3 (5.5) | 1 (2.2) | 4 (4.0) |
| Living with[e] | | | |
| Mother/stepmother | 51 (92.7) | 44 (95.7) | 95 (94.1) |
| Father/stepfather | 44 (80.0) | 34 (73.9) | 78 (77.2) |
| Sibling/s | 25 (45.5) | 30 (65.2) | 55 (54.5) |
| Partner | 2 (3.6) | 0 | 2 (2.0) |
| Other[f] | 4 (7.3) | 3 (6.5) | 7 (6.9) |
| Parent/caregiver with cancer[e] | | | |
| Mother | 35 (63.6) | 38 (82.6) | 73 (72.3) |
| Father | 14 (25.5) | 4 (8.7) | 18 (17.8) |
| Both | 6 (10.9) | 3 (6.5) | 9 (8.9) |
| Other[g] | 1 (1.8) | 1 (2.2) | 2 (2.0) |
| Parent's cancer type[e] | | | |
| Bowel/colorectal | 10 (18.2) | 7 (15.2) | 17 (16.83) |
| Brain | 2 (3.6) | 1 (2.2) | 3 (3.0) |
| Breast | 20 (36.4) | 25 (54.4) | 45 (44.6) |
| Kidney | 2 (3.6) | 0 | 2 (2.0) |
| Leukaemia/lymphoma | 9 (16.4) | 5 (10.9) | 14 (13.9) |
| Lung | 0 | 3 (6.5) | 3 (3.0) |
| Melanoma | 4 (7.3) | 1 (2.2) | 5 (5.0) |
| Ovarian | 5 (9.1) | 4 (8.7) | 9 (8.9) |
| Pancreatic | 2 (3.6) | 1 (2.2) | 3 (3.0) |
| Unknown primary | 3 (5.5) | 2 (4.4) | 5 (5.0) |
| Other[h] | 8 (14.6) | 4 (8.7) | 12 (11.9) |
| Unsure | 1 (1.8) | 1 (2.2) | 2 (2.0) |
| Parent's treatment status | | | |
| Active treatment | 28 (50.9) | 18 (39.1) | 46 (45.5) |
| Maintenance treatment | 9 (16.4) | 8 (17.4) | 17 (16.8) |
| Finished treatment | 15 (27.3) | 14 (30.4) | 29 (28.7) |
| Palliative/no further treatment available | 1 (1.8) | 2 (4.4) | 3 (3.0) |
| Unsure | 2 (3.6) | 4 (8.7) | 6 (5.9) |
| Parent's cancer recurred | | | |
| Yes | 11 (20.0) | 5 (10.9) | 16 (15.8) |
| No | 41 (74.6) | 39 (84.8) | 80 (79.2) |
| Unsure | 3 (5.5) | 2 (4.4) | 5 (5.0) |
| Support received prior to baseline[e] | | | |
| Counselling | 26 (47.3) | 27 (58.7) | 53 (52.5) |
| Canteen membership | 42 (76.4) | 41 (89.1) | 83 (82.2) |
| *Truce* group format[i] | | | |
| Face to face | 50 (90.9) | NA | NA |
| Online | 5 (9.1) | NA | NA |
| Number of siblings in the study | | | |
| 0 | 35 (63.6) | 29 (63.0) | 64 (63.4) |
| 1 | 17 (30.9) | 15 (32.6) | 32 (31.7) |
| 2 | 3 (5.5) | 2 (4.4) | 5 (5.0) |
| Number of surveys completed | | | |
| 2 | 7 (12.7) | 11 (23.9) | 18 (17.8) |
| 3 | 48 (87.3) | 35 (76.1) | 83 (82.2) |

[a] Other countries of birth included France, Mexico, New Zealand, United Kingdom, Zimbabwe.

[b] Other languages spoken at home included Creole, Czech, French, German, Japanese, Spanish, Swedish, Vietnamese.

[c] ABS Index of Relative Socioeconomic Advantage and Disadvantage (Australian Bureau of Statistics, 2016).

[d] Accessibility/Remoteness Index of Australian Bureau of Statistics (ABS), 2016 (ARIA+) (Hugo Centre for Population and Migration Studies, 2021).

[e] Participants could select multiple responses if applicable.

[f] Other people whom participants lived with included friends/housemates, grandparent(s), no-one.

[g] Others with cancer included grandparent, partner (in addition to a parent).

[h] Other cancer types included bladder, bone, cervical, central nervous system, head and neck, liver, prostate, stomach, testicular, thyroid.

[i] Intervention group only.

The process measures were: the Avoidance and Fusion Questionnaire – Youth (AFQ-Y8; Greco et al., 2008), a measure of psychological inflexibility; the Child and Adolescent Mindfulness Measure (CAMM; Greco et al., 2011), which measures mindfulness skills; and the Family Relationships Index (FRI; Kissane & Bloch, 2002), which measures perceived family functioning.

### 2.6.1. *Significant life events since T0*

The T1 and T2 surveys asked if participants had experienced any significant life events since completing the previous survey. Two authors (KA, KB) reviewed the responses and developed a coding scheme to incorporate this data into the quantitative analyses. Responses were coded for any significant occurrence between T0 and T2 (yes/no), whether these were positive/neutral (e.g. '*my mother has improved and is doing well after another operation*', '*started university, moved away from home*') or negative/mixed *('dad almost died before Christmas', 'my grandpa passed away [...] and I duxed one of my university subjects')*, and whether the life-changes were cancer-related or non-cancer-related. These questions were originally included for descriptive purposes (Patterson et al., 2015), but were added as secondary process variables to explore the role of additional stressors occurring during the study period.

### 2.6.2. *Covariates*

The T0 survey included questions about the young person's demographic characteristics, their parent's cancer, and prior supports received (see Table 1). Postcode was used to estimate geographic remoteness (Hugo Centre for Population and Migration Studies, 2021) and socioeconomic status (Australian Bureau of Statistics (ABS), 2016).

Several program-related measures were also collected for the

**Table 2**
Outline of Truce sessions and practice exercises (Allison et al., 2023).

| Session | Session content | Practice exercises |
|---|---|---|
| 1. What happened to my 'normal' life!? | Welcome, introduction and engagement activities, establishing group guidelines. Introduction to ACT and program overview. Psychoeducation on the impact of parental cancer. Opportunity to share own experiences, normalising feelings, fears and concerns. Introduction to dealing with feelings, and grief and loss. | Identify how you/people you know try to control difficult feelings. How well does this work? |
| 2. Dealing with feelings | Psychoeducation about the futility of trying to control unwanted feelings. Developing a different relationship with feelings; acknowledging them and allowing them to be present. | Commit to a values-consistent activity that you have previously found difficult. |
| 3. Being Mindful | Introduction to mindfulness: noticing thoughts, feelings and sensations and connecting with the present moment. Mindfulness practices in everyday life. Introduction to the BOLD acronym (Breathing, Observing, Listening and Deciding). | Mindfulness practice. Notice when you are acting consistent with your values. |
| 4. Sticky thoughts | Psychoeducation about the mind as a problem-finding and problem-solving machine, and the futility of trying to control unwanted thoughts. Introduction to the concept of sticky thoughts and how to develop a healthier relationship with them. | Day 1: Try to push out unwanted thoughts and notice what happens. Day 2: Notice, but don't try to control or avoid unwanted thoughts. |
| 5. Getting unstuck | Strategies for getting unstuck from difficult thoughts. Learning how to listen to our values and take committed action towards them. | Practice BOLD. Exercises to get unstuck from unwanted thoughts. |
| 6. Values and Loving-Kindness | **Joint session – young person and parent**. Continue building on concepts and strategies from Session 5. Work together on communication, values, loving-kindness and self-compassion. | Young people: Practice BOLD. More exercises to get unstuck from unwanted thoughts. Practice self-compassion and loving-kindness.<br>Parents: Practice loving-kindness.<br>Both: Complete family activity (decided during session). |
| 7. Taking action! | Identifying values and goals and committing to take action to live in line with them. Review and reflect on the whole *Truce* program. | |

intervention group including: group format (in person or online); number of sessions attended; number of homework exercises attempted; average interest rating score given after each session; total T1 satisfaction score; and a total fidelity score for the group (Allison et al., 2023; Patterson et al., 2015).

### 2.6.3. Other measures

Participants also completed the Reynolds Adolescent Depression Scale-2 (Reynolds & Mazza, 1998), the Keyes Psychological Well-being Scale (Keyes, 2006) and the Brief COPE measure of coping strategies (Carver, 1997). These were not used in the current analyses.

**Table 3**
Timing of measures.

| Measure | T0 | T1 | T2 | Each session |
|---|---|---|---|---|
| Outcomes | | | | |
| OCNI & K10 | X | X | X | |
| Process variables | | | | |
| AFQ-Y8, CAMM & FRI | X | X | X | |
| Significant life events since T0 | | X | X | |
| Covariates | | | | |
| Demographics, clinical variables & prior support | X | | | |
| Participant satisfaction | | X | | |
| Participant engagement | | | | X |
| Group fidelity ratings | | | | X |

OCNI = Offspring Cancer Needs Instrument, K10 = Kessler Psychological Distress Scale, AFQ-Y8 = Avoidance and Fusion Questionnaire – Youth, CAMM = Child and Adolescent Mindfulness Measure, FRI = Family Relationship Index.

## 2.7. Data analysis

### 2.7.1. Data entry and cleaning

Data entry, cleaning, and analysis was conducted in SPSS (IBM's Statistical Package for the Social Sciences Version 27.0.1). Given the high internal consistency of our measures, missing responses to individual survey items were imputed using the mean score for the domain/subscale, provided that fewer than 20% of responses were missing from that domain (Graham, 2009). This is consistent with other studies using the OCNI (McDonald et al., 2016).

### 2.7.2. Primary and secondary outcome analyses

Linear mixed model (LMM) analyses were used to examine the effect of the intervention on unmet needs and distress over time using Maximum Likelihood Estimation. This approach accommodates missing data by including all participants who attempted the surveys at least twice (Gabrio et al., 2022) and implicitly adjusts for baseline differences between conditions (Landau & Everitt, 2004).

A 'bottom-up' approach was used (West et al., 2022). First, bivariate analyses were conducted to identify significant predictors of each outcome at the 0.05 level. Next, a LMM was constructed, starting with an empty random intercept model at the participant level, with time of survey completion (0,1,2) treated as a continuous variable. The following components were added: a) a random slope for participant; b) random curvature for participant; c) a random intercept for family; d) a random slope for family; and e) a quadratic fixed effect of time. Each component was retained if they improved model fit. Next, the significant covariates were added to the model, followed by their interactions with time. Covariates or interactions that were not significant at the 0.05 level were excluded again. Age and gender were always included because they have repeatedly been associated with distress in this population (McDonald et al., 2016; Osborn, 2007; Rainville et al., 2012). We did not include relapse status in the models because of the relatively small amount of variance explained by the multivariate model predicting attrition, the lack of a significant bivariate association between relapse status and unmet needs or distress, and the fact that a significant number of participants were uncertain about their parents' relapse status.

Finally, condition (intervention vs control) and its interaction with time were added to the model. We checked the assumptions of the final model (West et al., 2022) and tested for an effect of the number of surveys completed to confirm that time of survey completion should be treated as continuous. Since three participants completed one of their surveys very late, resulting in an interval of less than four weeks between two surveys, we also conducted a sensitivity analysis by re-running the final model with their responses excluded.

For significant main effects of time, effect size was estimated by dividing the mean difference in outcome scores by the standard

**Table 4**
Outcome and process measures.

| Construct | Name | No. of items, domains | Response scale | Scoring | Example items | Reliability and validity | Internal consistency[a] |
|---|---|---|---|---|---|---|---|
| Outcomes | | | | | | | |
| Primary outcome: Unmet needs | Offspring Cancer Needs Inventory (OCNI) (Patterson et al., 2013) | 47 items, 7 domains (*Information about my parent's cancer, Family issues, Practical assistance, 'Time out' and recreation, Dealing with feelings, Support from my friends, Support from other young people*) | Four-point Likert scale (1 = *no need*, 2 = *low need*, 3 = *moderate need*, 4 = *strong need*). | OCNI Total score: Sum of Likert ratings for all items (range 47–172). Higher scores indicate more unmet needs. You can also count the number of needs endorsed as unmet (moderate or strong need). (Patterson et al., 2011) | Sentence stem: “*I currently need …*” E.g. “*help dealing with feelings of guilt related to my parent's cancer*” | Good convergent validity with a measure of psychological distress, moderate to high internal consistency, good content validity in a sample of AYA offspring (Patterson et al., 2013) | 0.97 |
| Secondary outcome: Psychological distress | Kessler Psychological Distress Scale (K10) (Kessler et al., 2002) | 10 items, 1 domain | Five-point Likert scale (1 = *none of the time*, 2 = *a little of the time*, 3 = *some of the time*, 4 = *most of the time*, 5 = *all of the time*). | Total distress score: Sum of Likert ratings for all items (range 10–50). Scores can be categorised as low (10–15), moderate (16–21), high (22–29), and very high (30–50) (Australian Bureau of Statistics, 2012) | Sentence stem: “*In the past 4 weeks how often did you feel …*” E.g. “*tired out for no good reason*” | Good construct validity and adequate criterion validity in the general adult population (Andrews & Slade, 2001). Acceptable construct validity with adolescents (Smout, 2019). | 0.92 |
| **Process variables** | | | | | | | |
| Psychological inflexibility | Avoidance and Fusion Questionnaire – Youth (AFQ-Y8) (Greco et al., 2008) | 8 items, 1 domain | Five-point Likert scale (0 = *not at all true*, 1 = *a little true*, 2 = *pretty true*, 3 = *true*, 4 = *very true*). | Total score: Sum of Likert ratings for all items (range 0–32). Higher scores indicate greater inflexibility. | “*I stop doing things that are important to me whenever I feel bad*” | Developed and validated with children and adolescents (Greco et al., 2008). 8-item version is more psychometrically robust and more accurate at screening for clinical depression and anxiety in high school students than the 17-item version (Renshaw, 2017) | 0.87 |
| Mindfulness | Child and Adolescent Mindfulness Measure (CAMM) (Greco et al., 2011) | 10 items, 1 domain | Five-point Likert scale (1 = *never true*, 2 = *rarely true*, 3 = *sometimes true*, 4 = *often true*, 5 = *always true*). | Total score: Sum of Likert ratings for all items (range 10–50). Higher scores indicate lower mindfulness. | Items relate to observing internal experiences (e.g. ”*I keep myself busy so I don't notice my thoughts or feelings*”), acting with awareness (e.g. “*I tend to go from place to place without noticing what I'm doing*”), and accepting without judgement (e.g. “*I think that some of my feelings are bad and that I shouldn't have them*”). | Moderate to good convergent validity with measures of similar constructs in 10–17 year-olds (Greco et al., 2011). Internal consistency, single-factor structure, and convergent validity confirmed for adolescents in non-clinical settings (Kuby et al., 2015). | 0.89 |
| Family functioning | Family Relationships Index (FRI) (Kissane & Bloch, 2002) | 12 items, 3 subscales (*Cohesiveness, Expressiveness, Conflict)* | Dichotomous response scale (1 = *true*, 0 = *false*) | FRI Total: Reverse score items in Conflict subscale, then sum all items (range 0–12). Higher scores indicate higher perceived functioning. | Cohesiveness e.g. “*There is a feeling of togetherness in our family*”. Expressiveness e.g. “*We tell each other about our personal problems*”. Conflict e.g. “*We fight a lot in our family*”. | Items were taken from the well-validated Family Environment Scale (FES) (Moos, 1990; Moos & Moos, 2009). Has satisfactory agreement with the longer scales of the FES (Kissane & Bloch, 2002) | 0.64 |

[a] Cronbach's alpha at baseline for combined sample.

deviation of the outcome variable (pooled across time-points and adjusted for the correlation between T0 and T2) (Lakens, 2013). For significant time*condition interaction effects, a conservative estimate of effect size was obtained by calculating the mean T0-T2 change scores for each condition and dividing the difference by the standard deviation of the outcome variable (pooled across time-points and conditions and weighted to adjust for differences in sample size) (Lakens, 2013).

#### 2.7.3. *Process variable analyses*

Moderation and mediation analyses were conducted on the intervention group data for outcome/s that showed significant time*condition interactions. Potential effects were tested separately due to correlations between the process variables, and to ensure sufficient power (Preacher & Hayes, 2008; Warner, 2012). These analyses were limited to the 48 intervention group participants who had data at T0 and T2.

***Moderation analyses.*** The SPSS macro MEMORE (MEdiation and MOderation for REpeated measures) was used for moderation analyses, as it supports analysis of repeated-measures data at two time-points (Montoya, 2019). It calculates difference scores in within-subjects variables (in this case the outcome variable from T0 to T2) and regresses them on between-subjects factors (in this case baseline process variables and significant covariates).

***Mediation analyses.*** The MEMORE macro was also used for mediation analyses, as it allows for testing of mediation effects in repeated measures designs with two occasions of testing (in this case T0 and T2) and uses Bootstrap methods of inference for indirect effects (Montoya & Hayes, 2017). We examined all three process variables as possible mediators, along with the other outcome variable.

#### 2.7.4. *Significant life event analyses*

Exploratory analyses examined the possible role of significant life events as moderators, using the MEMORE macro. We did not examine these variables as possible mediators because they were not collected at baseline. Instead, we conducted the moderation analyses separately for the two conditions (intervention and control).

**Table 5**
Baseline unmet needs and distress and post-baseline negative/mixed life events in the analysis sample.

| Variable | Statistic | Intervention (*n* = 55) | Control (*n* = 46) | Combined (*n* = 101) |
|---|---|---|---|---|
| Baseline unmet needs | | | | |
| OCNI Total score | *M (SD)* | 103.66 (30.70) | 100.85 (35.11) | 102.38 (32.64) |
| Needs endorsed as unmet | *M (SD)* | 18.31 (12.95) | 17.39 (13.46) | 17.89 (13.13) |
| Had 1+ unmet needs | *n* (%) | 48 (87.3) | 41 (89.1) | 89 (88.1) |
| Had 10+ unmet needs | *n* (%) | 37 (67.3) | 30 (65.2) | 67 (66.3) |
| Baseline distress | | | | |
| Total K10 distress score | *M (SD)* | 23.62 (10.15) | 22.24 (8.1) | 22.99 (9.3) |
| Category: Low | *n* (%) | 16 (29.1) | 9 (19.6) | 25 (24.8) |
| Moderate | *n* (%) | 11 (20.0) | 15 (32.6) | 26 (25.7) |
| High | *n* (%) | 13 (23.6) | 13 (28.3) | 26 (25.7) |
| Very high | *n* (%) | 15 (27.3) | 9 (19.6) | 24 (23.8) |
| Negative/mixed life events | | | | |
| Any (since T0) | *n* (%) | 26 (47.3) | 19 (41.3) | 45 (44.6) |
| Any cancer-related | *n* (%) | 11 (20.0) | 14 (30.4) | 25 (24.8) |
| Any non-cancer related | *n* (%) | 18 (32.7) | 9 (25.7) | 27 (26.7) |

## 3. Results

### 3.1. *Baseline needs and distress*

Table 5 shows participants' baseline levels of unmet needs and distress. Most (88.1%) endorsed at least one need and 66.3% endorsed ten or more needs. Approximately half (49.5%) were experiencing high or very high distress.

### 3.2. *Primary outcome analysis: changes in unmet needs*

Fig. 2 shows individual participants' OCNI Total scores at each time-point grouped by condition, and the average scores for each condition in bold. A high level of individual variation can be observed in participants' responses. Table 6 summarizes the results of the LMM. The final model accounted for 62.9% of the variance and included the following fixed effects: time, condition, time*condition, gender, time*gender, age, prior experience of counselling, employment status, and parent treatment status. It also included a random intercept and slope for participant, and a random intercept for family. The combined sample's unmet needs improved significantly over time (effect size = 0.42), and those improvements were significantly greater for the intervention group compared to controls (effect size = 0.29). Fig. 3 shows the estimated marginal means (EMMs) and 95% confidence intervals for this interaction effect. The difference between the EMM at T0 and T2 for the intervention group was 15.8 points on the OCNI, which is equivalent to 0.5 SD units.

Participants were likely to have more unmet needs if they were female, older, had already received counselling, or if their parent was on active treatment. They were likely to have fewer needs if they were in paid employment. The age*time interaction was significant, such that females in the combined sample experienced greater improvements in unmet needs over time compared to males.

All model assumptions were met, with the possible exception of constant covariance matrices for random coefficients, where a slight gender difference was apparent. This may have been related to the fact that there were substantially more females in the sample and would not be expected to bias the results (Schielzeth et al., 2020). There was no evidence of a significant effect of the number of surveys completed, and consistent findings were obtained from our sensitivity analysis.

Bivariate analyses for the intervention group yielded no evidence of a significant association between T2 OCNI score and any of the program variables (e.g. group format, number of sessions attended, number of homework exercises attempted).

### 3.3. *Secondary outcome analysis: changes in distress*

Fig. 2 shows individual participants' K10 scores at each time-point grouped by condition, and the average scores for each condition in bold. Table 7 summarizes the results of the LMM. The final model accounted for 62.1% of the variance and included the following fixed effects: time, condition, time*condition, gender, time*gender, age, and how long the participant had been a member of Canteen. It also included a random intercept for participant, and a random intercept for family.

The only significant predictor in the final model was gender, with females likely to have higher distress than males. There was no evidence of a significant improvement in distress over time, nor of a significant time*condition interaction. Fig. 3 shows the estimated marginal means and 95% confidence intervals for this (non-significant) interaction.

There were slight differences in the residual covariance matrices by gender, age, and time since diagnosis, and slight differences in random coefficient covariance matrices by gender, time since diagnosis, and condition. No adjustments were made since all detected differences were relatively small (Schielzeth et al., 2020). There was no evidence of a significant effect of the number of surveys completed, and consistent findings were obtained from our sensitivity analysis.

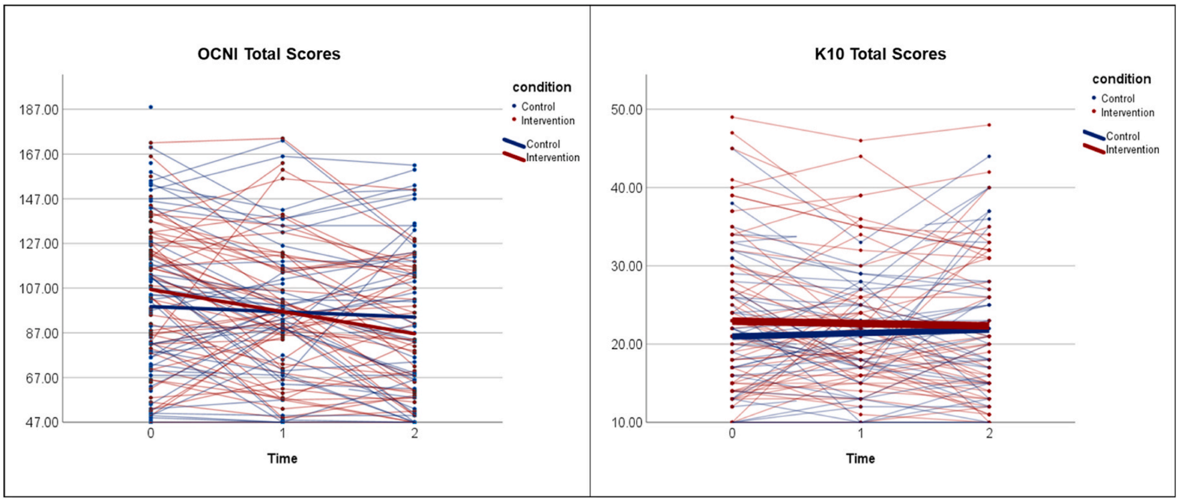

**Fig. 2.** OCNI and K10 Total scores at each time-point for individual participants grouped by condition, with group means (in bold) for each condition.

**Table 6**
LMM results exploring the effect of Truce on unmet needs (OCNI Total score) over time.

| Variables | Estimate | *SE* | *p* | 95% CI |
|---|---|---|---|---|
| *Fixed Effects* | | | | |
| Intercept | 34.93 | 16.48 | 0.036 | 2.31, 67.55 |
| Time | −5.01 | 2.43 | 0.042 | −9.84, −0.18 |
| Condition | | | | |
| Intervention | 2.67 | 5.18 | 0.606 | −7.58, 12.93 |
| Control | [a] | | | |
| Time*Condition | | | | |
| Intervention | −5.03 | 2.41 | 0.040 | −9.82, −0.24 |
| Control | [a] | | | |
| Gender | | | | |
| Female | 11.26 | 5.59 | 0.046 | 0.21, 22.32 |
| Male | [a] | | | |
| Time*Gender | | | | |
| Female | −5.82 | 2.64 | 0.030 | −11.06, −0.57 |
| Male | [a] | | | |
| Age | 4.42 | 1.02 | <0.001 | 2.40, 6.44 |
| Prior counselling | | | | |
| Yes | 10.85 | 4.71 | 0.023 | 1.52, 20.18 |
| No | [a] | | | |
| Paid employment | | | | |
| Yes | −25.44 | 5.47 | <0.001 | −36.27, −14.60 |
| No | [a] | | | |
| Parent treatment status | | | | |
| On active treatment | 14.11 | 4.82 | 0.004 | 4.55, 23.67 |
| Not on active treatment | [a] | | | |
| *Random Effects* | | | | |
| Residual | 260.87 | 39.54 | <0.001 | 193.82, 351.11 |
| Participant | | | | |
| Intercept | 442.39 | 137.02 | 0.001 | 241.08, 811.81 |
| Slope | −25.21 | 43.21 | 0.560 | −109.91, 59.49 |
| Family | | | | |
| Intercept | 149.91 | 114.16 | 0.189 | 33.70, 666.83 |

SE = standard error; p = p value; 95% CI = 95% confidence interval.
[a] Reference group.

Bivariate analyses for the intervention group yielded no evidence of a significant bivariate association between T2 K10 score and any program variables.

### 3.4. *Process variable analyses*

Since there was a significant time*condition interaction for unmet needs, we analysed the intervention group data to identify predictors of improvement in unmet needs (moderators) and possible mechanisms of this change (mediators).

#### 3.4.1. *Moderation analyses*

For those in the intervention condition, greater improvements in unmet needs were associated with having higher baseline distress ($t = 2.36$, $df = 47$, $p = 0.022$), and being less mindful at baseline (signified by a higher score on the CAMM; $t = 2.07$, $df = 47$, $p = 0.044$). Baseline psychological inflexibility ($t = 1.23$, $df = 47$, $p = 0.226$) and family functioning ($t = -1.33$, $df = 46$, $p = 0.190$) were not significant moderators, and no significant demographic or clinical moderators were identified. The path diagram for the significant moderators is shown in Fig. 4.

#### 3.4.2. *Mediation analyses*

For those in the intervention condition, none of the process variables were significant mediators of the improvement in unmet needs, nor was distress. Fig. 5 presents the mediation path diagram, and Table 8 presents the parameters for each path. Follow-up LMM analyses indicated no main effect of time on psychological inflexibility or mindfulness, and no significant time*condition interaction for either variable. There was a main effect of time on family functioning, but no significant time*condition interaction (see Supplementary Table 2).

### 3.5. *Significant life event analyses*

Just under half of participants reported at least one negative/mixed life event from T0-T2, with approximately equal numbers reporting events related (24.8%) and unrelated to cancer (26.7%) (see Table 5). For controls, experiencing one or more negative/mixed life events related to cancer was a significant moderator of the improvement in unmet needs ($t = -2.36$, $df = 33$, $p = 0.024$). Specifically, those who reported negative/mixed cancer events experienced no significant change in unmet needs ($t = -0.39$, $df = 33$, $p = 0.698$), but those who did not report such events experienced a significant reduction in unmet needs ($t = 3.26$, $df = 33$, $p = 0.003$). For the intervention group, negative/mixed cancer related life events was not a significant moderator of change ($t = -1.26$, $df = 45$, $p = 0.214$). Experiencing negative/mixed life event/s that were unrelated to cancer was not a significant moderator for the control ($t = 0.26$, $df = 33$, $p = 0.798$) or intervention ($t = 0.21$, $df = 43$, $p = 0.837$) groups.

## 4. Discussion

In a context where tailored interventions for AYAs impacted by parental cancer are limited (Alexander et al., 2019; Walczak et al., 2018), *Truce* represents a novel and important addition to the landscape of supportive services for families affected by cancer (Allison et al.,

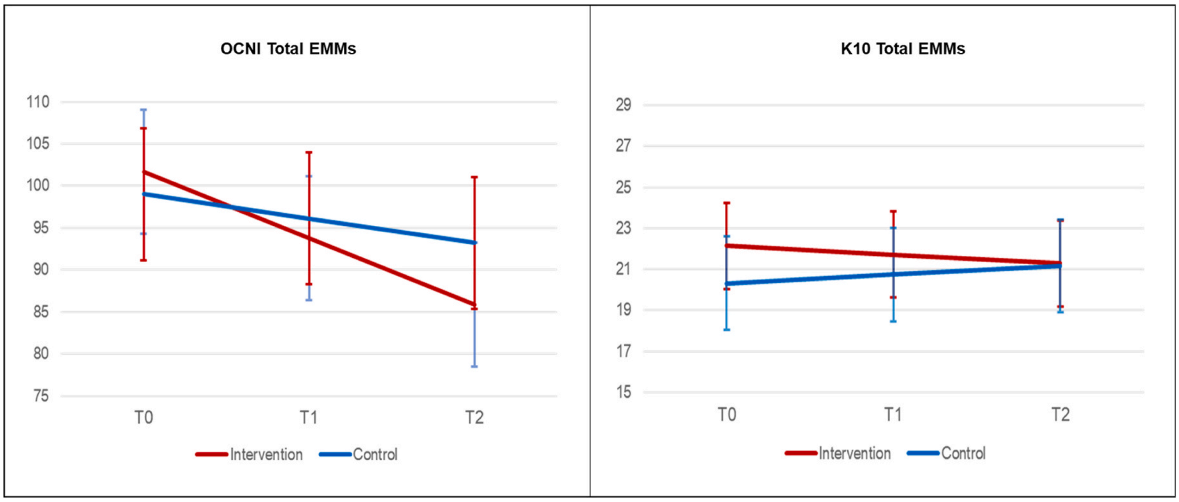

**Fig. 3.** Estimated marginal means for OCNI and K10 Total scores at each time-point by condition, with 95% confidence intervals.

**Table 7**
LMM results exploring the effect of Truce on distress (K10 score) over time.

| Variables | Estimate | *SE* | *p* | 95% CI |
|---|---|---|---|---|
| *Fixed Effects* | | | | |
| Intercept | 13.17 | 4.18 | 0.002 | 4.90, 21.44 |
| Time | 0.23 | 0.67 | 0.728 | −1.09, −1.56 |
| Condition | | | | |
| Intervention | 1.83 | 1.46 | 0.212 | −1.06, 4.71 |
| Control | [a] | | | |
| Time*Condition | | | | |
| Intervention | −0.85 | 0.66 | 0.204 | −2.16, 0.46 |
| Control | [a] | | | |
| Gender | | | | |
| Female | 4.69 | 1.57 | 0.003 | 1.60, 7.78 |
| Male | [a] | | | |
| Time*Gender | | | | |
| Female | −1.33 | 0.73 | 0.070 | −2.77, 0.11 |
| Male | [a] | | | |
| Age | 0.45 | 0.25 | 0.080 | −0.05, 0.95 |
| Time with XXXX | −0.82 | 0.42 | 0.052 | −1.65, 0.01 |
| *Random Effects* | | | | |
| Residual | 20.54 | 2.17 | <0.001 | 16.71, 25.26 |
| Participant | | | | |
| Intercept | 33.65 | 11.48 | 0.003 | 17.24, 65.69 |
| Family | | | | |
| Intercept | 16.18 | 11.86 | 0.172 | 3.85, 68.04 |

SE = standard error; p = p value; 95% CI = 95% confidence interval.

[a] Reference group.

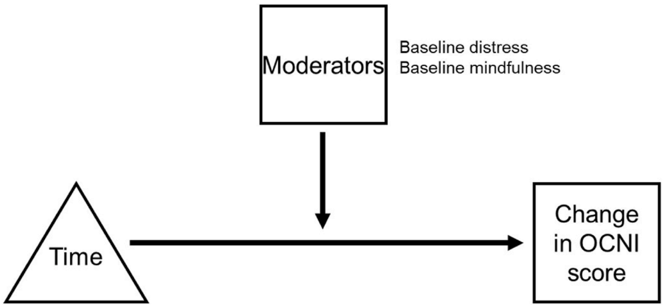

**Fig. 4.** Significant moderators of improvement in unmet needs in the intervention group.

2023; Patterson et al., 2015). We found that while AYAs' unmet needs tended to decrease over time, *Truce* participants experienced significantly greater improvements relative to controls. Furthermore, the program seemed to buffer against the impact of negative cancer-related life events, such as deteriorations in the health or prognosis of the parent with cancer. However, our participants did not experience significant

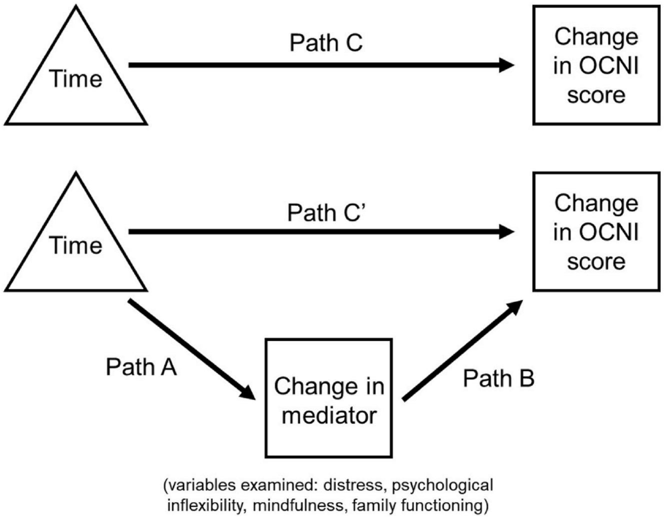

**Fig. 5.** Path diagram for mediation analyses.

**Table 8**
Mediation analysis of changes in unmet needs for the intervention group[a].

| Potential Mediator | Path A<br>β (*SE*) | Path B<br>β (*SE*) | Path C′<br>β (*SE*) | Path C<br>β (*SE*) |
|---|---|---|---|---|
| Distress | 1.81 (0.97) | 1.76 (0.51)[b] | 14.55 (3.50)[c] | 17.74 (3.76)[c] |
| Psychological inflexibility | −0.17 (0.72) | 1.86 (2.60)[a] | 17.77 (3.52)[c] | 17.45 (3.69)[c] |
| Mindfulness | 2.06 (1.15) | 0.93 (0.45)[a] | 15.53 (3.68)[c] | 17.45 (3.69)[c] |
| Family functioning | −0.45 (0.40) | −1.32 (1.40) | 16.99 (3.83)[c] | 17.59 (3.77)[c] |

All change scores were calculated as T0 minus T2. Therefore a positive β value represents an improvement in OCNI, distress, psychological inflexibility and mindfulness (higher CAMM scores equate to less mindfulness), while a negative β value represents an improvement in family functioning.

[a] $p < .05$.

[b] $p < .01$.

[c] $p < .001$.

improvements in the ACT process variables, and no mediators were identified for the reduction in unmet needs. Thus, while *Truce* appears to offer therapeutic benefits over and above the expected adjustment to the cancer situation over time, the mechanisms of change remain unclear.

This paper builds on preliminary evaluation work showing that *Truce* participants perceive benefits from its therapeutic teachings, opportunities for peer connection, and co-involvement of parents (Allison et al., 2023). The present analysis demonstrated that unmet needs decreased significantly for the combined sample, and that this improvement was significantly greater for the intervention group. The average reduction in unmet needs for the intervention group from T0 to T2 was 0.5 SD units, which meets the cut-off for significant change used by the Australian government to assess mental health services (Department of Health and Ageing, 2013). The effect size for the intervention-specific effect (0.29) compares favourably to those seen in a recent systematic review of interventions targeting adolescent well-being and distress, which obtained an average effect size of 0.24 for subjective well-being, 0.25 for psychological well-being, and 0.28 for depression symptoms (Tejada-Gallardo et al., 2020).

Thus, it appears that *Truce* both equips participants with coping skills to help them navigate the challenges of parental cancer (Allison et al., 2023), and directly addresses some of their unmet needs. This is promising as unmet needs are typically associated with higher levels of distress and poorer psychological functioning (Landi et al., 2022; McDonald et al., 2016; Walczak et al., 2018), and reducing unmet needs may have flow-on benefits for well-being. While no significant reduction in distress was observed in this study, it is possible that the timeframe for follow-up was insufficient to capture potential improvements in distress associated with the resolution of unmet needs (particularly as the distress measure asks about symptoms over a four-week period), and/or that the potential floor effect that we identified for the distress measure impacted the analysis. A previous process evaluation of an ACT-based residential program for AYAs impacted by cancer found that significant improvements in distress were only experienced by participants who had clinical levels of distress at baseline (Patterson et al., 2021). It may be that ACT, which focusses on accepting challenging thoughts and feelings, should not be expected to alter distress levels if/when they could be considered to be proportionate to the young person's circumstances.

Follow-up analyses indicated that *Truce* participants who experienced negative or mixed cancer-related life events appeared to be shielded from the worsened unmet needs experienced by the control group, suggesting that the program helps participants adapt to and manage the challenges of cancer as they arise. This is particularly encouraging since adverse events have been associated with poorer resilience and mental health amongst childhood cancer survivors (Schwartz et al., 2023). While this exploratory finding requires further investigation, it is supported by qualitative feedback from participating AYAs and parents, who reported gaining insights and coping strategies which could be applied both within and beyond the immediate cancer situation (Allison et al., 2023).

These findings demonstrate that a program based on the therapeutic principles of ACTis not only feasible and acceptable (Allison et al., 2023; Patterson et al., 2021) but also useful to AYAs impacted by parental cancer, adding to the growing body of research supporting its use (Bai et al., 2020; Coto-Lesmes et al., 2020; Fashler et al., 2018; Feliu-Soler et al., 2018; Gloster et al., 2020; González-Fernández & Fernández-Rodríguez, 2019; Haugmark et al., 2019; Zhao et al., 2021). However, while participants perceived therapeutic value in the ACT teachings (Allison et al., 2023), this evaluation did not find evidence of any significant changes in psychological inflexibility or mindfulness over the course of the study. This stands in contrast to previous studies on the mechanisms of change in ACT, which have demonstrated that it is possible to improve psychological flexibility and thereby improve physical and mental health (Patterson et al., 2022; Stockton et al., 2019). Qualitative feedback indicated that some younger AYAs had struggled with the content of session and practice activities, requiring facilitators to adapt their delivery (Allison et al., 2023). This may have impacted learnings around psychological flexibility and mindfulness. The measures used to assess these constructs may have also lacked sufficient sensitivity to detect changes over time (Goodman et al., 2017; Lewis, 2020), particularly as no timeframes were specified (Greco et al., 2008, 2011). Alternatively, *Truce* may have benefitted participants via other mechanisms – or different subgroups of participants may have benefitted from different aspects of the program. For example, it may have addressed unmet needs for peer support directly by providing a space for AYAs to interact with each other (Clarke et al., 2021; Patterson et al., 2021; Tucker et al., 2013). Future evaluation research may benefit from a process-based therapy or idionomic approach (Hayes et al., 2022).

Interestingly, secondary analyses revealed that AYAs in the intervention group with higher distress and/or lower mindfulness at baseline showed greater reductions in unmet needs, suggesting that *Truce* is most beneficial for those with poorer psychological well-being who may be in greater need of coping mechanisms to adjust to the cancer situation. This is consistent with previous evaluations showing that clinical populations, those with greater distress, and those with lower levels of mindfulness and psychological flexibility reported greater benefits of ACT- and mindfulness-based interventions (Patterson et al., 2021; Zoogman et al., 2015). However, the benefits of *Truce* were not moderated by any demographic variables, suggesting that the program is equally appropriate across genders, ages, and other demographic groups. Given the high level of individual variation in participants' responses, a future study could conduct a latent class growth curve analysis on this data to further investigate different patterns of change.

While not playing a moderating effect for the intervention group, several demographic and clinical predictors of well-being were identified across the combined sample. Consistent with some previous studies (Walczak et al., 2018), females reported significantly more unmet needs and higher distress than males, which may have contributed to our finding that females reported greater improvements in unmet needs over time. The higher unmet needs we observed in older participants have also been reported elsewhere, though not consistently (Walczak et al., 2018). Possible reasons include greater awareness of the implications of a cancer diagnosis, taking on more responsibilities, and/or experiencing greater conflict between the need for independence and the need for family closeness (Huizinga et al., 2011; McDonald et al., 2016; Rainville et al., 2012). Observed associations between previous counselling, employment status and unmet needs suggest that AYAs experiencing greater levels of unmet need may find it difficult to pursue full-time employment and may have previously been motivated to seek psychosocial support for these issues. Finally, the higher level of unmet needs reported by offspring of parents on active treatment could reflect a greater degree of family disruption experienced at that time. These findings could help to identify vulnerable populations who may benefit from additional psychosocial support, such as *Truce*.

### *4.1. Strengths and limitations*

Study strengths include administering validated psychometric measures across three time-points, and the inclusion of a wait-list control group: this enabled assessment of whether the effects of *Truce*'s were maintained over a longer time-period, facilitated stronger causal conclusions, and allowed impacts to be delineated from expected fluctuations over time. The evaluation of *Truce* across many groups means that the observed effects are not limited to a specific context or facilitator. However, the study used a pragmatic rather than random allocation of participants to study conditions, which was necessary to ensure sufficient numbers of AYAs in an area to run programs. While this method may increase external validity (Patterson et al., 2015), there may have been pre-existing differences between conditions that were not completely accounted for in our analysis.

Of note, a high proportion of participants had either previously received counselling (52%) or were members of a community support organisation (82%) and some were already familiar with ACT principles (Allison et al., 2023). While neither prior experience of counselling nor length of involvement with a support organisation were found to be moderators, it is possible that the impacts of *Truce* could differ for those who have not received any prior support. We were unable to control for any concurrent support that participants may have been receiving during the data collection period. Likewise, the study sample may have been biased by participant drop-out. While the 41 participants who dropped out after baseline had equivalent levels of distress, unmet needs, psychological flexibility, mindfulness, and family functioning to the analysis sample, some demographic differences were noted, with parent relapse being a significant predictor in the final multivariate model predicting attrition. The question of Truce's effectiveness for young people experiencing a parent's relapse merits further investigation with a larger sample.

The study was also impacted by the limitations of some of the measures we used, particularly in relation to sensitivity to change, and further work is needed to evaluate and improve measures of key ACT processes for the AYA age range (Goodman et al., 2017; Lewis, 2020). Finally, the number of participants in the intervention condition limited statistical power for mediation and moderation analyses.

## 5. Conclusions

In the sparse landscape of supportive interventions for young people impacted by parental cancer (Alexander et al., 2019; Walczak et al., 2018), *Truce* and its evaluation represent an important contribution to the literature. Complimenting previous findings that *Truce* is both feasible and acceptable to AYA offspring (Allison et al., 2023), we demonstrated that the program confers greater reductions in unmet needs over time compared to a wait-list and seems to buffer the impacts of negative cancer-related life events.

## Declaration of interests

FM, PP, KB, KA & SK are affiliated with Canteen, which developed and owns the intellectual property rights to the Truce program evaluated in this paper. There are no other conflicts of interest to disclose.

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## Trial registration

This study was registered with the Australian and New Zealand Clinical Trials registry (ACTRN12615000761561).

## Data sharing

Data is available upon reasonable request.

## CRediT authorship contribution statement

**Kit Bibby:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Fiona E.J. McDonald:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Joseph Ciarrochi:** Writing – review & editing, Methodology, Formal analysis, Conceptualization. **Kimberley R. Allison:** Writing – review & editing, Writing – original draft, Project administration, Formal analysis, Data curation. **Nicholas J. Hulbert-Williams:** Writing – review & editing, Methodology, Formal analysis, Conceptualization. **Stephanie Konings:** Writing – review & editing, Project administration, Investigation. **Adam Wright:** Writing – review & editing, Project administration, Investigation, Data curation. **Danielle Tracey:** Writing – review & editing, Methodology, Conceptualization. **Pandora Patterson:** Writing – review & editing, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization.

## Declaration of competing interest

FM, PP, KB, KA & SK are affiliated with Canteen, which developed and owns the intellectual property rights to the *Truce* program evaluated in this paper. There are no other conflicts of interest to disclose.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jcbs.2024.100813.

## References

Alexander, E. S., O'Connor, M., & Halkett, G. K. B. (2023). The psychosocial effect of parental cancer: Qualitative interviews with patients' dependent children. *Children, 10*(1). https://doi.org/10.3390/children10010171

Alexander, E., O'Connor, M., Rees, C., & Halkett, G. (2019). A systematic review of the current interventions available to support children living with parental cancer. *Patient Education and Counseling, 102*(10), 1812–1821. https://doi.org/10.1016/j.pec.2019.05.001

Allison, K. R., Patterson, P., McDonald, F. E. J., Bibby, K., Ciarrochi, J., Tracey, D., Hayes, L. L., Wright, A., Konings, S., Davis, E., Hulbert-Williams, N. J., Wakefield, C. E., & White, K. (2023). Truce: Feasibility and acceptability of an Acceptance and Commitment Therapy-based intervention for adolescents and young adults impacted by parental cancer. *Journal of Contextual Behavioral Science, 28*, 91–101. https://doi.org/10.1016/j.jcbs.2023.03.014

Andrews, G., & Slade, T. (2001). Interpreting scores on the kessler psychological distress Scale (K10). *Australian & New Zealand Journal of Public Health, 25*(6), 494–497. https://doi.org/10.1111/j.1467-842X.2001.tb00310.x

Australian Bureau of Statistics (ABS). (2012). Information paper: Use of the kessler psychological distress Scale in ABS health surveys, Australia, 2007-08. https://www.abs.gov.au/ausstats/abs@.nsf/mf/4817.0.55.001.

Australian Bureau of Statistics (ABS). (2016). *Socio-economic indexes for areas (SEIFA)*. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001.

Azarbarzin, M., Malekian, A., & Taleghani, F. (2015). Effects of supportive-educative program on quality of life of adolescents living with a parent with cancer. *Iranian Journal of Nursing and Midwifery Research, 20*(5), 577–581. https://doi.org/10.4103/1735-9066.164510

Bach, P., & Moran, D. (2008). *ACT in practice: Case conceptualization in acceptance and commitment therapy*. New Harbinger.

Bai, Z., Luo, S., Zhang, L., Wu, S., & Chi, I. (2020). Acceptance and commitment therapy (ACT) to reduce depression: A systematic review and meta-analysis. *Journal of Affective Disorders, 260*, 728–737. https://doi.org/10.1016/j.jad.2019.09.040

Bergersen, E., Larsson, M., Lövgren, M., & Olsson, C. (2022). Adolescents' and young people's needs and preferences for support when living with a parent with life-threatening cancer: A grounded theory study. *BMC Palliative Care, 21*(1), 164. https://doi.org/10.1186/s12904-022-01055-7

Bugge, K. E., Helseth, S., & Darbyshire, P. (2008). Children's experiences of participation in a family support program when their parent has incurable cancer. *Cancer Nursing, 31*(6), 426–434. https://doi.org/10.1097/01.NCC.0000339250.83571.b0

Bugge, K. E., Helseth, S., & Darbyshire, P. (2009). Parents' experiences of a Family Support Program when a parent has incurable cancer. *Journal of Clinical Nursing, 18*(24), 3480–3488. https://doi.org/10.1111/j.1365-2702.2009.02871.x

Burley, J., & McAloon, J. (2024). Group acceptance and commitment therapy for adolescent anxiety: A systematic review and meta-analysis. *Journal of Contextual Behavioral Science, 31*, Article 100712. https://doi.org/10.1016/j.jcbs.2023.11.003

CanTeen. (2008). *Now what.? Dealing with your parent's cancer.* CanTeen.

Carver, C. S. (1997). You want to measure coping but your protocol's too long - consider the Brief COPE. *International Journal of Behavioural Medicine, 4*(1), 92–100. https://doi.org/10.1207/s15327558ijbm0401_6

Cho, O. H., Yoo, Y. S., & Hwang, K. H. (2015). Comparison of parent-child communication patterns and parental role satisfaction among mothers with and without breast cancer. *Applied Nursing Research, 28*(2), 163–168. https://doi.org/10.1016/j.apnr.2014.09.005

Ciarrochi, J., Hayes, L., & Bailey, A. (2012). *Get out of your mind and into your life for teens: A guide to living an extraordinary life*. New Harbinger.

Clarke, K., Patterson, P., McDonald, F. E. J., Wakefield, C. E., Sansom-Daly, U., & Zebrack, B. (2021). The development and process evaluation of a 3-day Acceptance and Commitment Therapy group program for adolescent cancer survivors. *Child and Youth Care Forum, 50*, 229–246. https://doi.org/10.1007/s10566-020-09571-4

Clemens, D. A. (2009). The significance of motherhood for adolescents whose mothers have breast cancer. *Oncology Nursing Forum, 36*(5), 571–577. https://doi.org/10.1188/09.ONF.571-577

Cohen, J. (1988). *Statistical power analysis for the behavioral Sciences* (2nd ed.). Lawrence Erlbaum Associates.

Coto-Lesmes, R., Fernández-Rodríguez, C., & González-Fernández, S. (2020). Acceptance and Commitment Therapy in group format for anxiety and depression. A systematic review. *Journal of Affective Disorders, 263*, 107–120. https://doi.org/10.1016/j.jad.2019.11.154

Davey, M. P., Kissil, K., Lynch, L., Harmon, L. R., & Hodgson, N. (2013). A culturally adapted family intervention for African American families coping with parental cancer: Outcomes of a pilot study. *Psycho-Oncology, 22*(7), 1572–1580.

Department of Health and Ageing. (2013). *National mental health report 2013: Tracking progress of mental health reform in Australia 1993-2011*. Commonwealth of Australia.

Ellis, S. J., Wakefield, C. E., Antill, G., Burns, M., & Patterson, P. (2017). Supporting children facing a parent's cancer diagnosis: A systematic review of children's psychosocial needs and existing interventions. *European Journal of Cancer Care, 26* (1), Article e12432. https://doi.org/10.1111/ecc.12432

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

Feliu-Soler, A., Montesinos, F., Gutiérrez-Martínez, O., Scott, W., McCracken, L. M., & Luciano, J. V. (2018). Current status of acceptance and commitment therapy for chronic pain: A narrative review. *Journal of Pain Research, 11*, 2145–2159. https://doi.org/10.2147/jpr.S144631

Finch, A., & Gibson, F. (2009). How do young people find out about their parent's cancer diagnosis: A phenomonological study. *European Journal of Oncology Nursing, 13*(3), 213. https://doi.org/10.1016/j.ejon.2009.03.010

Gabrio, A., Plumpton, C., Banerjee, S., & Leurent, B. (2022). Linear mixed models to handle missing at random data in trial-based economic evaluations. *Health Economics, 31*(6), 1276–1287. https://doi.org/10.1002/hec.4510

Gloster, A. T., Walder, N., Levin, M. E., Twohig, M. P., & Karekla, M. (2020). The empirical status of acceptance and commitment therapy: A review of meta-analyses. *Journal of Contextual Behavioral Science, 18*, 181–192. https://doi.org/10.1016/j.jcbs.2020.09.009

González-Fernández, S., & Fernández-Rodríguez, C. (2019). Acceptance and commitment therapy in cancer: Review of applications and findings. *Behavioral Medicine, 45*(3), 255–269. https://doi.org/10.1080/08964289.2018.1452713

Goodman, M. S., Madni, L. A., & Semple, R. J. (2017). Measuring mindfulness in youth: Review of current assessments, challenges, and future directions. *Mindfulness, 8*(6), 1409–1420. https://doi.org/10.1007/s12671-017-0719-9

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60*(1), 549–576. https://doi.org/10.1146/annurev.psych.58.110405.085530

Greco, L. A., Baer, R. A., & Smith, G. T. (2011). Assessing mindfulness in children and adolescents: Development and validation of the child and adolescent mindfulness measure (CAMM). *Psychological Assessment, 23*(3), 606–614.

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood adolescence: Development and evaluation of the avoidance and fusion Questionnaire for youth. *Psychological Assessment, 20*, 93–102.

Haugmark, T., Hagen, K. B., Smedslund, G., & Zangi, H. A. (2019). Mindfulness- and acceptance-based interventions for patients with fibromyalgia - a systematic review and meta-analyses. *PLoS One, 14*(9), Article e0221897. https://doi.org/10.1371/journal.pone.0221897

Hayes, S. C., Ciarrochi, J., Hofmann, S. G., Chin, F., & Sahdra, B. (2022). Evolving an idionomic approach to processes of change: Towards a unified personalized science of human improvement. *Behaviour Research and Therapy, 156*, Article 104155. https://doi.org/10.1016/j.brat.2022.104155

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44*(1), 1–25. https://doi.org/10.1016/j.brat.2005.06.006

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy (an experiential approach to behavior change)*. Guildford Publications.

Hugo Centre for Population and Migration Studies. (2021). Accessibility/remoteness Index of Australia (ARIA). Retrieved 1/11/2022 from https://able.adelaide.edu.au/hugo-centre/services/aria.

Huizinga, G. A., Visser, A., Zelders-Steyn, Y. E., Teule, J. A., Reijneveld, S. A., & Roodbol, P. F. (2011). Psychological impact of having a parent with cancer. *European Journal of Cancer, 47*(Suppl 3), S239–246. https://doi.org/10.1016/S0959-8049(11)70170-8

Hulbert-Williams, N., 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*, 15–27. https://doi.org/10.1111/ecc.12223

Jansen, J. E., Gleeson, J., Bendall, S., Rice, S., & Alvarez-Jimenez, M. (2020). Acceptance- and mindfulness-based interventions for persons with psychosis: A systematic review and meta-analysis. *Schizophrenia Research, 215*, 25–37. https://doi.org/10.1016/j.schres.2019.11.016

John, K., Becker, K., & Mattejat, F. (2013). Impact of family-oriented rehabilitation and prevention: An inpatient program for mothers with breast cancer and their children. *Psycho-Oncology, 22*(12), 2684–2692. https://doi.org/10.1002/pon.3329

Karlsson, E., Andersson, K., & Ahlström, B. H. (2013). Loneliness despite the presence of other - adolescents' experiences of having a parent who becomes ill with cancer. *European Journal of Oncology Nursing, 17*, 697–703. https://doi.org/10.1016/j.ejon.2013.09.005

Kennedy, V. L., & Lloyd-Williams, M. (2009). Information and communication when a parent has advanced cancer. *Journal of Affective Disorders, 114*(1), 149–155. https://doi.org/10.1016/j.jad.2008.06.022

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L. T., Walters, E. L., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959–976. https://doi.org/10.1017/S0033291702006074

Keyes, C. L. M. (2006). Mental health in adolescence: Is America's youth flourishing? *American Journal of Orthopsychiatry, 76*(3), 395–402. https://doi.org/10.1037/0002-9432.76.3.395

Kissane, D. W., & Bloch, S. (2002). *Family focused grief therapy*. Open University Press.

Kobayashi, M., Heiney, S. P., Osawa, K., Ozawa, M., & Matsushima, E. (2017). Effect of a group intervention for children and their parents who have cancer. *Palliative & Supportive Care, 15*(5), 575–586. https://doi.org/10.1017/s1478951516001115

Kuby, A., Mclean, N., & Allen, K. (2015). Validation of the child and adolescent mindfulness measure (CAMM) with non-clinical adolescents. *Mindfulness, 6*(6), 1448–1455. https://doi.org/10.1007/s12671-015-0418-3

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology, 4*. https://doi.org/10.3389/fpsyg.2013.00863. Article 863.

Landau, S., & Everitt, B. S. (2004). *A handbook of statistical analyses using SPSS*. Chapman & Hall/CRC. http://www.academia.dk/BiologiskAntropologi/Epidemiologi/PDF/SPSS_Statistical_Analyses_using_SPSS.pdf.

Landi, G., Duzen, A., Patterson, P., McDonald, F. E. J., Crocetti, E., Grandi, S., & Tossani, E. (2022). Illness unpredictability and psychosocial adjustment of adolescent and young adults impacted by parental cancer: The mediating role of unmet needs. *Supportive Care in Cancer, 30*(1), 145–155. https://doi.org/10.1007/s00520-021-06379-3

Lewis, M. J. (2020). *Measuring psychological flexibility in adolescence*. Cardiff University.

Lewis, F. M., Loggers, E. T., Phillips, F., Palacios, R., Tercyak, K. P., Griffith, K. A., Shands, M. E., Zahlis, E. H., Alzawad, Z., & Almulla, H. A. (2020). Enhancing connections-palliative care: A quasi-experimental pilot feasibility study of a cancer parenting program. *Journal of Palliative Medicine, 23*(2), 211–219. https://doi.org/10.1089/jpm.2019.0163

Li, Z., Li, Y., Guo, L., Li, M., & Yang, K. (2021). Effectiveness of acceptance and commitment therapy for mental illness in cancer patients: A systematic review and meta-analysis of randomised controlled trials. *International Journal of Clinical Practice, 75*(6), Article e13982. https://doi.org/10.1111/ijcp.13982

Li, H., Wong, C. L., Jin, X., Chen, J., Chong, Y. Y., & Bai, Y. (2021). Effects of acceptance and commitment therapy on health-related outcomes for patients with advanced cancer: A systematic review. *International Journal of Nursing Studies, 115*, Article 103876. https://doi.org/10.1016/j.ijnurstu.2021.103876

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, 15*(3), 427–451. https://doi.org/10.1007/s11764-020-00938-z

Maynard, A., Patterson, P., McDonald, F. E. J., & Stevens, G. (2013). What is helpful to adolescents who have a parent diagnosed with cancer? *Journal of Psychosocial Oncology, 31*(6), 675–697. https://doi.org/10.1080/07347332.2013.835021

McDonald, F. E. J., Patterson, P., Tindle, R., & Costa, D. (2020). What young people need when a family member dies of cancer. *Supportive Care in Cancer, 28*(4), 1631–1638. https://doi.org/10.1007/s00520-019-04973-0

McDonald, F. E. J., Patterson, P., White, K. J., Butow, P. N., Costa, D. S., & Kerridge, I. (2016). Correlates of unmet needs and psychological distress in adolescent and young adults who have a parent diagnosed with cancer. *Psycho-Oncology, 25*(4), 447–454. https://doi.org/10.1002/pon.3942

Montoya, A. K. (2019). Moderation analysis in two-instance repeated measures designs: Probing methods and multiple moderator models. *Behavior Research Methods, 51*(1), 61–82. https://doi.org/10.3758/s13428-018-1088-6

Montoya, A. K., & Hayes, A. F. (2017). Two-condition within-participant statistical mediation analysis: A path-analytic framework. *Psychological Methods, 22*(1), 6–27. https://doi.org/10.1037/met0000086

Moos, R. H. (1990). Conceptual and empirical approaches to developing family-based assessment procedures: Resolving the case of the Family Environment Scale. *Family Process, 29*(2), 199–208.

Moos, R., & Moos, B. (2009). *Family Environment Scale manual and sampler set: Development, applications and research*. Palo Alto, CA: Mind Garden Inc.

Morris, J. N., Martini, A., & Preen, D. (2016). The well-being of children impacted by a parent with cancer: An integrative review. *Supportive Care in Cancer, 24*(7), 3235–3251. https://doi.org/10.1007/s00520-016-3214-2

Morris, J., Turnbull, D., Preen, D., Zajac, I., & Martini, A. (2018). The psychological, social, and behavioural impact of a parent's cancer on adolescent and young adult offspring aged 10-24 at time of diagnosis: A systematic review. *Journal of Adolescence, 65*, 61–71. https://doi.org/10.1016/j.adolescence.2018.03.001

Nicholls, W., Patterson, P., McDonald, F., & Hulbert-Williams, N. (2017). Unmet needs in young adults with a parent with chronic condition: A mixed method investigation and measure development study. *Scandinavian Journal of Caring Sciences, 31*, 191–200. https://doi.org/10.1111/scs.12320

Ohan, J. L., Jackson, H. M., Bay, S., Morris, J. N., & Martini, A. (2020). How psychosocial interventions meet the needs of children of parents with cancer: A review and critical evaluation. *European Journal of Cancer Care, 29*(5), Article e13237. https://doi.org/10.1111/ecc.13237

Osborn, T. (2007). The psychosocial impact of parental cancer on children and adolescents: A sytematic review. *Psycho-Oncology, 16*, 101–126.

Patterson, P., McDonald, F. E. J., Bibby, H., & Allison, K. R. (2022). What helps distressed Australian adolescents impacted by cancer? Mechanisms of improvement of the PEER program. *Health and Social Care in the Community, 30*(6), e4673–e4683. https://doi.org/10.1111/hsc.13873

Patterson, P., McDonald, F. E. J., Butow, P., White, K. J., Costa, D. S., Pearce, A., & Bell, M. L. (2013). Psychometric evaluation of the Offspring Cancer Needs Instrument (OCNI): An instrument to assess the psychosocial unmet needs of young people who have a parent with cancer. *Supportive Care in Cancer, 21*(7), 1927–1938. https://doi.org/10.1007/s00520-013-1749-z

Patterson, P., McDonald, F. E. J., Ciarrochi, J., Hayes, L., Tracey, D., Wakefield, C. E., & White, K. (2015). A study protocol for *Truce*: A pragmatic controlled trial of a seven-week acceptance and commitment therapy program for young people who have a parent with cancer. *BMC Psychology, 3*(1). https://doi.org/10.1186/s40359-015-0087-y. Article 31.

Patterson, P., McDonald, F. E. J., Kelly-Dalgety, E., Luo, A., & Allison, K. R. (2021). The development and process evaluation of peer: A camp-based programme for adolescents impacted by cancer. *Journal of Child and Family Studies, 30*(11), 2627–2640. https://doi.org/10.1007/s10826-021-02061-8

Patterson, P., McDonald, F. E. J., White, K. J., Walczak, A., & Butow, P. N. (2017). Levels of unmet needs and distress amongst adolescents and young adults (AYAs) impacted by familial cancer. *Psycho-Oncology, 26*(9), 1285–1292. https://doi.org/10.1002/pon.4421

Patterson, P., Pearce, A., & Slawitschka, E. (2011). The initial development of an instrument to assess the psychosocial needs and unmet needs of young people who have a parent with cancer: Piloting the Offspring Cancer Needs Instrument (OCNI). *Supportive Care in Cancer, 19*(8), 1165–1174. https://doi.org/10.1007/s00520-010-0933-7

Perak, K., McDonald, F. E. J., Conti, J., Yao, Y. S., & Skrabal Ross, X. (2024). Family adjustment and resilience after a parental cancer diagnosis. *Supportive Care in Cancer, 32*(7), 409. https://doi.org/10.1007/s00520-024-08608-x

Petersen, J. M., Zurita Ona, P., & Twohig, M. P. (2024). A review of Acceptance and Commitment Therapy for adolescents: Developmental and contextual considerations. *Cognitive and Behavioral Practice, 31*(1), 72–89. https://doi.org/10.1016/j.cbpra.2022.08.002

Phillips, F., & Lewis, F. M. (2015). The adolescent's experience when a parent has advanced cancer: A qualitative inquiry. *Palliative Medicine, 29*(9), 851–858. https://doi.org/10.1177/0269216315578989

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. https://doi.org/10.3758/BRM.40.3.879

Rainville, F., Dumont, S., Simard, S., & Savard, M. H. (2012). Psychological distress among adolescents living with a parent with advanced cancer. *Journal of Psychosocial Oncology, 30*(5), 519–534. https://doi.org/10.1080/07347332.2012.703765

Renshaw, T. L. (2017). Screening for psychological inflexibility: Initial validation of the Avoidance and Fusion Questionnaire for Youth as a school mental health screener. *Journal of Psychoeducational Assessment, 35*(5), 482–493. https://doi.org/10.1177/0734282916644096

Reynolds, W. M., & Mazza, J. J. (1998). Reliability and validity of the Reynolds adolescent depression Scale with young adolescents. *Journal of School Psychology, 36*, 265–312.

Schielzeth, H., Dingemanse, N. J., Nakagawa, S., Westneat, D. F., Allegue, H., Teplitsky, C., Réale, D., Dochtermann, N. A., Garamszegi, L. Z., & Araya-Ajoy, Y. G. (2020). Robustness of linear mixed-effects models to violations of distributional assumptions. *Methods in Ecology and Evolution, 11*(9), 1141–1152. https://doi.org/10.1111/2041-210X.13434

Schmitt, F., Manninen, H., Santalahti, P., Savonlahti, E., Pyrhönen, S., Romer, G., & Piha, J. (2007). Children of parents with cancer: A collaborative project between a child psychiatry clinic and an adult oncology clinic. *Clinical Child Psychology and Psychiatry, 12*(3), 421–436. https://doi.org/10.1177/1359104507078475

Schwartz, L. F., Tan, M. M., McCrae, J. S., Burkhardt, T., Ness, K. K., & Henderson, T. O. (2023). Adverse childhood experiences and resilience in childhood and adolescent and young adult cancer patients. *Pediatric Blood and Cancer, 70*(3), Article e30141. https://doi.org/10.1002/pbc.30141

Semple, C. J., & McCance, T. (2010). Parents' experience of cancer who have young children. A literature review. *Cancer Nursing, 33*(2), 110–118. https://doi.org/10.1097/NCC.0b013e3181c024bb

Shands, M. E., & Lewis, F. M. (2021). Parents with advanced cancer: Worries about their children's unspoken concerns. *American Journal of Hospice and Palliative Medicine, 38*(8), 920–926. https://doi.org/10.1177/1049909120969120

Smout, M. F. (2019). The factor structure and predictive validity of the Kessler Psychological Distress Scale (K10) in children and adolescents. *Australian Psychologist, 54*(2), 102–113. https://doi.org/10.1111/ap.12376

Stockton, D., Kellett, S., Berrios, R., Sirois, F., Wilkinson, N., & Miles, G. (2019). Identifying the underlying mechanisms of change during acceptance and commitment therapy (ACT): A systematic review of contemporary mediation studies. *Behavioural and Cognitive Psychotherapy, 47*(3), 332–362. https://doi.org/10.1017/s1352465818000553

Tanner, J. L., & Arnett, J. J. (2016). Emerging adult clinical psychology. In G. R. Norcross, D. K. VandenBos, D. K. Freedheim, & M. M. Domenech Rodriguez (Eds.), *APA handbook of clinical psychology: Roots and branches* (pp. 127–138). American Psychological Association. https://doi.org/10.1037/14772-007.

Tejada-Gallardo, C., Blasco-Belled, A., Torrelles-Nadal, C., & Alsinet, C. (2020). Effects of school-based multicomponent positive psychology interventions on well-being and distress in adolescents: A systematic review and meta-analysis. *Journal of Youth and Adolescence, 49*(10), 1943–1960. https://doi.org/10.1007/s10964-020-01289-9

Thastum, M., Johansen, M. B., Gubba, L., Olesen, L. B., & Romer, G. (2008). Coping, social relations, and communication: A qualitative exploratory study of children of parents with cancer. *Clinical Child Psychology and Psychiatry, 13*(1), 123–138. https://doi.org/10.1177/1359104507086345

Torp, S., Thoresen, L., Gronningsaeter, A. B., Grove, E. K., & Gustavsen, K. (2013). Financial and social effects on children and adolescents when a parent is diagnosed with cancer. *Child and Adolescent Social Work Journal, 30*, 293–310. https://doi.org/10.1007/s10560-012-0290-0

Tucker, A. R., Sugerman, D., & Zelov, R. (2013). On Belay: Providing connection, support, and empowerment to children who have a parent with cancer. *Journal of Experiential Education, 36*(2), 93–105. https://doi.org/10.1177/1053825913487889

Tulpin, M., Scherrens, A. L., Van Driessche, A., Verhofstadt, L. L., Kreicbergs, U., Goubert, L., & Beernaert, K. (2024). "A sincere 'how are you?' is already a sign of acknowledgement that you're there too." - interview study on the support needs of adolescents and young adults (AYAs) living with a parent with cancer. *European Journal of Oncology Nursing, 70*, Article 102602. https://doi.org/10.1016/j.ejon.2024.102602

Visser, A., Huizinga, G. A., van der Graaf, W. T., Hoekstra, H. J., & Hoekstra-Weebers, J. E. (2004). The impact of parental cancer on children and the family: A review of the literature. *Cancer Treatment Reviews, 30*(8), 683–694. https://doi.org/10.1016/j.ctrv.2004.06.001

Walczak, A., McDonald, F., Patterson, P., Dobinson, K., & Allison, K. (2018). How does parental cancer affect adolescent and young adult offspring? A systematic review. *International Journal of Nursing Studies, 77*, 54–80. https://doi.org/10.1016/j.ijnurstu.2017.08.017

Wang, J., & Fang, S. (2023). Effects of internet-based acceptance and commitment therapy (IACT) on adolescents: A systematic review and meta-analysis. *International Journal of Mental Health Promotion, 25*(4), 433–448. https://doi.org/10.32604/ijmhp.2023.025304

Warner, R. M. (2012). *Applied statistics: From bivariate through multivariate techniques* (2nd ed.). SAGE Publications.

Weeks, N., McDonald, F. E. J., Patterson, P., Konings, S., & Coad, J. (2019). A summary of high quality online information resources for parents with cancer who have adolescent and young adult children: A scoping review. *Psycho-Oncology, 28*(12), 2323–2335. https://doi.org/10.1002/pon.5274

West, B. T., Welch, K. B., & Galecki, A. T. (2022). *Linear mixed models: A practical guide using statistical software* (3rd ed.). Chapman & Hall.

Wong, M. L., Cavanaugh, C. E., MacLeamy, J. B., Sojourner-Nelson, A., & Koopman, C. (2009). Posttraumatic growth and adverse long-term effects of parental cancer in children. *Families, Systems & Health, 27*(1), 53–63.

Wray, A., Seymour, J., Greenley, S., & Boland, J. W. (2022). Parental terminal cancer and dependent children: A systematic review. *BMJ Supportive & Palliative Care*. https://doi.org/10.1136/bmjspcare-2021-003094. *bmjspcare-2021-003094*.

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*, Article 110304. https://doi.org/10.1016/j.jpsychores.2020.110304

Zoogman, S., Goldberg, S. B., Hoyt, W. T., & Miller, L. (2015). Mindfulness interventions with youth: A meta-analysis. *Mindfulness, 6*(2), 290–302.

Zwarenstein, M., Treweek, S., Gagnier, J. J., Altman, D. G., Tunis, S., Haynes, B., Oxman, A.d., & Moher, D. (2008). Improving the reporting of pragmatic trials: An extension of the CONSORT statement. *BMJ, 337*, a2390. https://doi.org/10.1136/bmj.a2390