

e-TC: Development and pilot testing of a web-based intervention to reduce anxiety and depression in survivors of testicular cancer

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feedback on the website, particularly the consumers who gave very generously of their time and effort in contributing to the project.

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### Abstract

e-TC is an online intervention designed to address common psychosocial concerns of testicular cancer survivors. It aims to reduce anxiety, depression and fear of cancer recurrence by providing evidence-based information and psychological intervention. This paper details the development and pilot testing of e-TC. During pilot testing, 25 men (with varying psychological profiles) who had completed treatment for testicular cancer, six months to five years ago (which had not recurred), used e-TC over a 10-week period and provided quantitative and qualitative feedback on the feasibility and acceptability of the program. Six men also completed a qualitative interview to provide detailed feedback on their experiences using e-TC. Fourteen men (56%) completed at least 80% of the program. Participants reported a high level of satisfaction with the program. Men's limited time was a barrier to program use and completion, and participants suggested that men with a more recent diagnosis and a higher level of distress may be more likely to engage with the program. e-TC appears to be a feasible and acceptable online intervention for survivors of testicular cancer. Findings from this study are currently being used to refine e-TC and guide the design of a larger efficacy study.

Keywords: testicular cancer, online intervention, fear of cancer recurrence, anxiety, depression, survivors

### Introduction

Testicular cancer (TC) is the most common non-skin cancer in men aged 20 to 39 years (International Agency for Research on Cancer, 2007). While the incidence of TC has increased in the past three decades, mortality has decreased (Australian Institute of Health and Welfare (AIHW), 2012a, 2012b) due to improvements in diagnosis and treatment. With five-year

survival rates of 96-99% (AIHW, 2012b), the number of long-term TC survivors has risen steadily and with this the number of survivors with cancer- and treatment-related concerns.

Testicular cancer can impact on a man's quality of life in a number of ways. First, TC is typically diagnosed at a relatively young age, when men may be undergoing important aspects of personal development, transitioning from school to university or work, and establishing long-term intimate relationships and family. The existential crisis precipitated by TC can therefore be highly distressing. Second, depending on treatment type and intensity, TC can have implications for reproductive and physical functioning (Kim et al., 2012). Unsurprisingly therefore, anxiety (Dahl et al., 2005; Fossa, Dahl, & Loge, 2003; Smith et al., 2016) and sometimes depression (Shinn et al., 2007; Smith et al., 2016), have been found to be elevated among TC survivors compared with the general population. Fear of cancer recurrence (FCR) is highly prevalent, with more than a quarter of TC survivors reporting 'quite a bit' or 'very much' FCR an average of 11 years after diagnosis (Pedersen et al., 2012; Skaali et al., 2009).

About two-thirds of TC survivors report having at least one unmet need (Bender et al., 2012; Jonker-Pool et al., 2004; Smith et al., 2013a), most commonly relating to supportive care, survivorship information, managing distress, fertility, relationships and body image (Bender, et al., 2012; Smith et al., 2013a). Meeting these needs is challenging, as men (particularly younger men) tend not to seek professional help for distress (Gulliver, Griffiths, & Christensen, 2010; Oliver et al., 2005; Rickwood, Deane, & Wilson, 2007). Reported barriers to help-seeking generally include inconvenience, cost, and stigma associated with accessing mental health services (Gulliver et al., 2010; Muriel et al., 2009). In addition, there is increasing evidence that men may be particularly reluctant to seek professional help due to 'traditional' masculine attitudes encouraging self-sufficiency, stoicism and toughness (White et al., 2011). Thus there is a need to develop interventions that are both accessible and acceptable to men.

Galdas et al. (2014) recently conducted a systematic review and meta-synthesis of qualitative studies investigating the accessibility and acceptability of self-management support interventions (both offline and online) for men with long-term conditions including cancer. Galdas et al. (2014) found that self-management interventions were perceived as more acceptable when they were compatible with "masculine ideals associated with independence, stoicism, and control" (p. 17), and more enticing when they offered practical, purposeful and meaningful coping strategies. Online self-management interventions may be a more acceptable form of help-seeking for men, as they enable men to take control over managing their distress (promoting self-sufficiency and independence) and to do so privately, in a way that does not undermine their outward projection of masculine ideals.

Online psychological interventions have the potential to overcome many reported barriers to seeking help for distress and coping. A large proportion of cancer survivors (43 -

51%) report positive attitudes towards using online interventions for self-management functions, such as coping with the consequences of cancer in daily life (Jansen, 2015). Younger cancer survivors and those diagnosed with prostate or testicular cancer were particularly likely to hold positive attitudes towards web-based self-management (Jansen, 2015). Two additional studies evaluating the supportive care needs of TC survivors both concluded that online interventions may be useful for addressing unmet needs (Bender et al., 2012; Smith et al., 2013), with the majority of TC survivors reporting they would use an online intervention (44% definitely, 43% possibly) (Bender et al., 2012).

Online interventions addressing anxiety and depression in the general population have demonstrated similar levels of efficacy to face-to-face interventions in both the general population and cancer patients (Griffiths, Farrer, & Christensen, 2010; Jacobsen & Jim, 2008). There is emerging but mixed evidence of their utility for people affected by cancer (e.g., David et al., 2013; Wootten et al., 2015), indicating a need for further development and evaluation. A 2015 systematic review noted the paucity of studies reporting on the efficacy of eHealth interventions for cancer patients or survivors and called for further development and evaluation using validated measures (McAlpine et al., 2015). Online interventions for people affected by cancer vary widely, with some focused on cancer survivors generally (Beatty et al., 2015; Willems et al., 2015), some focused on a specific issue such as fatigue (Foster et al., 2016) and others focused on people affected by a particular type of cancer, such as breast (Fergus et al., 2014) or prostate cancer (Wootten et al., 2015).

In particular, the 'My Road Ahead' program (Wootten et al., 2014), developed for men with prostate cancer, addresses survivor-specific issues similar to those affecting TC survivors (e.g., sexuality and masculinity). However several important differences between testicular and prostate cancer survivors, namely age, disease trajectory, treatment side-effect severity, and long-term psychosocial impacts (Luckett, King, & Stockler, 2010), support the need for an intervention specifically tailored to this group. The aim of the current paper is to describe the development and piloting of an online intervention designed to reduce anxiety, depression, FCR and associated unmet needs in TC survivors, called e-TC. The primary outcomes of interest for the e-TC pilot study were feasibility and acceptability of the intervention, as opposed to efficacy.

## **Method**

### ***e-TC program development***

The content of e-TC was based on our earlier findings regarding the psychosocial impact of TC (Smith et al., 2013a; Smith et al., 2013b) and was also broadly guided by principles around design of self-management interventions for men (Galdas et al., 2014). The development process was guided by existing online interventions and evidence-based therapies, including: 1)

the My Road Ahead program for prostate cancer survivors (Wootten et al., 2014); 2) consumer cancer information booklets and webpages developed by the Cancer Councils of New South Wales and Western Australia, Australia's community-based, independent cancer charities (e.g., Cancer Council NSW, 2012a, 2012b, 2013, 2014); and 3) the therapist manual for 'Conquer Fear' (Butow et al., 2013), an intervention designed to assist cancer survivors better manage FCR. Additional material was purpose-developed for e-TC via iterative feedback from a multidisciplinary expert advisory group comprising cancer clinicians, clinical psychologists, health researchers and consumers to facilitate a patient-centred approach critical to promoting intervention uptake (Crutzen, 2012; van Gemert-Pijnen et al., 2011).

e-TC was comprised of six interactive modules, including psycho-educational material, short survivor and educational videos, and offline exercises. e-TC was designed to present information and exercises tailored according to user-reported relationship status (partnered or unpartnered), side-effect profile and baseline treatment goals, to ensure relevance (Carpentier & Fortenberry, 2010). Modules were designed to take approximately an hour to complete, depending on level of engagement. The design of e-TC followed a train theme ("Getting Back on Track"). Modules were presented as train line maps, with key subsection headings representing stops on each train line (see Fig. 1).

Content and skills taught are detailed in Table 1. The therapeutic content of e-TC was primarily based on cognitive behavioural therapy, Acceptance and Commitment Therapy (ACT; Harris, 2013; Hayes et al., 2006; Hayes & Wilson, 1994), metacognitive therapy (Wells, 1999), mindfulness (a component of ACT) and relaxation. There is existing evidence that these kinds of interventions can be effectively delivered online (see Wootten et al., 2014, for references). Men were encouraged to restructure or accept unpleasant thoughts and feelings, and engage with, rather than avoid, challenging situations, armed with the knowledge and skills gained through the program. A range of relaxation approaches were included (e.g., breathing exercises, reassuring self-talk, progressive muscle relaxation, guided imagery, exercise, Tai Chi and Qi Gong) and users were encouraged to try each approach and continue practising those perceived to be enjoyable and effective.

Men completed measures of *distress and impact* of reported distress on two thermometers that appeared on-screen after 0, 20, 40, 60, 80 and 100% of e-TC had been completed, with results charted over time, so users could monitor their progress. Men indicated their level of distress in the previous week from 0 (no distress) to 10 (high distress) (Roth et al., 1998), and the impact that the distress had on their life from 0 (no impact) to 10 (high impact) (Akizuki et al., 2005). Based on clinically established cut-offs (Akizuki et al., 2005), if participants scored four or higher for distress and three or higher for impact, they received an on-screen acknowledgement of their distress, and a link to the website's resources page, which

included contact details for telephone counselling services (i.e. Lifeline, MensLine and The Cancer Council helpline). If participants scored five or higher for distress and three or higher for impact they were additionally informed that a research team member would contact them to discuss any concerns and provide further assistance.

Insert table 1 here

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Module 1, the 'Foundations' module, was compulsory and completed first. The other five modules could be completed in any order. Within modules, users could progress from start to finish or navigate to specific subsections using a menu. This approach was taken to foster autonomy and is consistent with adult learning principles (Lieb, 1991) and masculine ideals of control and autonomy.

### ***Ethical Approval***

Study approval was granted by relevant institutional ethics committees and the study was registered with the Australian New Zealand Clinical Trials Registry (ACTRN12614000111673).

### ***Pilot Study***

#### ***Participants and Procedure***

Eligible men were aged over 18 years, had completed treatment for TC between six months and five years previously, showed no evidence of recurrence, had internet access at least weekly for up to ten weeks and had adequate English proficiency.

Clinician-members of the Australian and New Zealand Urogenital and Prostate Clinical Trials Group (ANZUP) invited eligible patients attending follow-up appointments to participate. The research co-ordinator then phoned interested men to provide further information. After confirming consent, men were given a registration code to sign-up to e-TC with a secure login and password. Baseline questionnaires were completed when men logged in to e-TC for the first time. Participants then configured their own reminder email schedule (every 5, 7 or 10 days). Reminders were automatically sent if delays in completing the intervention or associated questionnaires occurred. Regarding tailoring, only the relationship status tailoring was activated in this pilot stage to encourage participants to provide feedback on the entire website.

### ***Measures***

#### ***Primary outcomes: feasibility and acceptability***

The feasibility and acceptability of e-TC was evaluated in a manner consistent with that recommended by Bowen et al. (2009). Bowen et al. (2009, p. 453) state that pilot or feasibility studies "are used to determine whether an intervention is appropriate for further testing"; they propose eight general foci of feasibility studies, four of which guided the assessment of feasibility in the current study (demand, implementation, practicality and acceptability).

*Demand* for an intervention is indicated by the use of the intervention or specific intervention components. *Implementation* refers to whether, and to what extent, an intervention can be implemented as planned. *Practicality* is the degree to which an intervention can be delivered despite real-world constraints. These aspects of feasibility were assessed as the *proportion of e-*

*TC completed*, indicated by completed distress and impact thermometers (which appeared on-screen after participants had worked through 0, 20, 40, 60, 80 and 100% of e-TC), and user *engagement* with the program (which was assessed by number of site logins, average number of pages viewed, and average session length). User data were extracted for the period June 1, 2014 to March 13, 2015 using Google Analytics (<http://www.google.com/analytics/ce/nrs/>).

*Acceptability*, the reactions of the intended recipients to the intervention (Bowen et al., 2009), was measured by participants' satisfaction with e-TC, assessed via a purpose-built questionnaire completed at the end of each module and once e-TC, or the 10 week access period, had been completed (i.e. follow-up). Participants indicated on an 11-point scale (0 = not, 10 = very) how acceptable, useful, comprehensive, relevant, helpful, easy to use and long (0 = too short, 10 = too long) they found each module and the program as a whole. Participants could also give additional free-text feedback.

#### *Secondary outcomes:*

*Distress and impact* of reported distress were measured on the two thermometers discussed above, throughout program engagement.

*Anxiety and depression* in the past week were measured using the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) at baseline, once 50% of e-TC was completed, and at follow-up. Subscale scores range from 0-21 and can be classified as subclinical (0-7), possible case (8-10) and definite case (11-21).

*Fear of cancer recurrence* in the past month was assessed at baseline and follow-up using the 4-item Fear of Recurrence Scale (Rabin, Leventhal, & Goodin, 2004), in which individual item scores are averaged to give a score range of 1-4 with higher scores indicating greater FCR.

The HADS and Fear of Recurrence Scale were not used to evaluate the efficacy of e-TC in this study. They were included to help characterise the study sample and evaluate the feasibility of using these measures in a *future* study specifically designed to evaluate the efficacy of e-TC.

Six men (three who had completed all of e-TC, two who had completed at least 80% and one who had completed between 40 and 60%) were invited to participate in a 20 minute semi-structured telephone interview. This purposive sampling allowed exploration of both e-TC experiences and reasons for non-completion. Pseudonyms are used in the results section.

#### *Analysis*

Quantitative demographic, medical and psychological data were summarised using descriptive statistics, as were program completion frequencies and individual module and overall program

satisfaction scores. Qualitative data (free text feedback and interview data) were managed and thematically analysed using NVIVO (QSR International Pty Ltd. Version 10, 2012).

## Results

### *Sample characteristics*

Of 51 men invited to participate, 27 (53%) consented, but 2 (4%) subsequently withdrew, giving an actual response rate of 49% (N=25). The most common reason reported for non-participation was lack of time. The 25 participants were young (mean age=37.6 years, standard deviation (SD)=8.0, range=27-57), well-educated (80% tertiary), employed full/part-time (84%), partnered (88%), and childless (52%). Men were on average 2.8 years post-diagnosis (SD=1.7, range=1.2-5.0). The majority were diagnosed with Stage I disease (60%; 24% Stage II; 16% Stage III). All participants had orchidectomy and 13 (52%) had chemotherapy. Of the 13 who had chemotherapy, 4 (16%) also had retroperitoneal lymph node dissection and 1 (4%) also had radiotherapy.

Eleven men (44%) reported a history of anxiety or depression. Three of these (12%) had previously seen a psychologist or psychiatrist and two (8%) had previously taken medication. Whilst participating in the pilot study, three men (12%) were seeing a psychologist and/or taking medication for psychological difficulties. At baseline, five (20%) of the men reported clinically significant levels of anxiety, one (4%) reported clinically significant depression, and two (8%) reported FCR symptoms 'often' or 'all of the time'.

### *Feasibility*

Desktop/laptop computers were used to access the site 88% of the time, while 7% of devices used were tablets and 5% were mobile phones. *Proportion of e-TC completed:* Of the 25 consenting participants, 14 (56%) completed  $\geq 80\%$  of the intervention, three completed 40%, one completed 20%, and seven completed  $< 20\%$ . *Engagement:* During the study period, 296 sessions were logged. The average time per session was 20 minutes (range 5-60) and the average number of pages viewed was 11 (range 3-45). Five of the seven (71%) men who completed  $< 20\%$  scored zero for both distress and impact, while only two of the 14 (14%) who completed  $\geq 80\%$  of the intervention scored zero on every thermometer, suggesting that low need may have contributed to poor engagement. However, percentage of e-TC completed was not significantly correlated with baseline anxiety, depression or FCR, although the small sample may have limited statistical power to detect such associations.

### *Acceptability*

The acceptability of e-TC was indicated by men's *satisfaction* with various aspects of the program. Mean satisfaction ratings for the overall program were fairly high (range=7.9–8.9). Ratings for the degree to which men found e-TC acceptable, useful, comprehensive, relevant and easy to use are presented in Table 2. Although men indicated the overall program was slightly too long (M=6.7, 95%CI=5.5-7.8), length ratings for individual modules were close to five, “just right”, with confidence intervals for four of the six modules including the “just right” score (see Table 2). Visual inspection of the data suggested that some participants might have misconstrued the response scale for the question regarding overall program length, which was different to that for other satisfaction items. Rather than higher scores indicating greater satisfaction, a score of 5 (just right) was optimal with scores on either side indicating that the program was too short or too long. A substantial proportion of users who had responded to other acceptability aspects of the overall program with ratings of 9 or 10 also responded to the question about overall program length with a rating of 9 or 10. The only participant to mention time commitment in the free-text comments (Richard), highlighting the need to emphasise “the point of putting time aside to complete modules at regular intervals”, rated the length 6 (i.e., slightly above “just right”). Therefore these high scores may represent measurement error, rather than a judgement that the program was too long.

### *Qualitative results*

#### Feasibility

Qualitative data suggested lack of time was a key factor in non-completion. According to participants, each module took 45 to 60 minutes to complete and while some men felt as though “time wise, I think it was ok ... it wasn't something that was a waste of time at all” (Anthony), others struggled with the need to balance time spent using e-TC with competing demands such as “working full time, I've got two kids, I'm studying at the moment as well” (Leon). However, participants felt the time commitment would not have concerned them as much if they had used e-TC closer to the time of diagnosis and treatment or if they were using it to manage anxiety or depression. One participant said

“if, for example, you're off work and, like you said, you had some high levels of anxiety ... you'd probably have the time and the motivation to commit an hour or two per day and work the way through the course ... The content being relevant, you'd have the motivation to commit the time to it.” (Leon)

It was also suggested that preparing men by “stressing the point of putting time aside to complete modules at regular intervals” (Richard) would likely increase completion rates.

In terms of how easy e-TC was to use, feedback suggested that “overall it's a fantastic information resource, easy to access and use” (Neil) and participants described the program as “user-friendly” (Anthony), “fairly intuitive” (Peter) and “straightforward” (Frank). Most participants liked the interactivity and wanted more of it. However the challenge of engaging in some of the cognitive tasks was highlighted, with one participant stating that he didn't want to:

“spend too long wracking my own brains of that about things [sic]... it's very difficult to disentangle ... how I was responding to what I'd gone through with what was already there. Then, secondly, I just find it enormously difficult to put thoughts into words in any case because thoughts - they're hard to harness, aren't they? And kind of crystallise and get down on paper.”  
(Frank)

Men felt e-TC was flexible enough so “[you could] pick up what you want and what you need from the website” (Leon), although the participants agreed that additional tailoring and “providing the option for further information if people want it” (Jeremy) would enhance ease of use.

#### Acceptability/satisfaction

Overall men gave positive feedback about e-TC, saying “it definitely worked for me” (Anthony), “overall it was really good” (Peter) and “I thought it was great, it was really well-done” (Jeremy). Men felt e-TC overcame barriers such as stigma or embarrassment associated with seeking help for mental health issues. One participant said

“if you're quite a shy type of person it gives you the opportunity to sort of not feel like you're having to disclose everything to somebody, and you can get information and know where to go to if you are needing further assistance, which I think is really valuable.” (Peter)

Participants felt e-TC overcame their sense of isolation by presenting videos and other material that they could “definitely relate to” and which made them feel as though “you're basically not alone in what you're going through.” (Anthony) The educational and survivor videos elicited positive feedback. For example, Jeremy said “it was engaging because of the (educational) videos (and) ... to hear it from other people who've gone through it and their experiences and the stuff that a doctor can't tell you - I found that really terrific.” Leon said “I quite like the video content, hearing those real stories” and Neil described e-TC as “sort of like a

little community ... where you feel engaged with the application (and) you want to, you know, continue through it and learn more and... you want to interact with that group, with their experience.” e-TC was also perceived to provide reassurance that “there are people out there trying to help you get through it and understand it” (Anthony), and to normalise their experiences by “someone talking about ‘that’s a normal side effect and that can last you six to ... whatever that might be’ ... that provides me comfort, if that makes sense” (Leon).

Regarding the cognitive tools, what men “did find helpful was probably some of the techniques around ... anxiety management, trying to manage some of those more negative thoughts and the like” (Leon). Men also found the downloadable forms useful, with one participant stating “I’ve saved a few of those things and printed a couple of things off at work and I’ve got them on my desk just to reflect back onto when I’m having some thoughts ...” (Peter). Module 6 was described as “a very helpful module. The practical information re work, finances and insurance was great. I also found a number of the tools quite helpful around managing the concern of recurrence.” (Leon)

*Comprehensiveness:* Overall, most participants reported that e-TC “was very in-depth and thorough” (Jeremy), and “struck that balance between providing enough information to provide comfort but not providing too much that (men) feel they don’t need to raise it with their doctor” (Leon). One participant stated “it never struck me that there was something that was relevant to me that wasn’t covered” (Frank). However other participants put forward suggestions for website content and features that they felt would enhance the comprehensiveness of e-TC, including information tailored to men’s needs addressing different types of TC, stage-related treatments and associated side effects, as well as information and exercises for partners.

*Relevance:* Participants reported that e-TC content resonated closely with their experiences, enabling them to relate to the material. One participant stated “whatever I was feeling and all I felt during my treatment and that, I actually thought it was sort of covered in the module. So, yeah, I related to it quite easily to be honest.” (Anthony) In particular, the provision of an Australian resource was appreciated, with one participant saying that at the time of his diagnosis, “there wasn’t a lot of Australian-based material ... on testicular cancer”. (Leon) This participant also explained that the structure of e-TC allowed him to spend “more time on the [modules] that I thought were more relevant and where I thought I was going to get something out of it.” (Leon) One participant acknowledged that as he was “two years post-surgery the course was not as relevant to me. However I definitely think it would be very useful to have available to people coping with chemo and cancer.” (John)

### **Suggestions for improvement**

A common suggestion was that having access to e-TC earlier in the illness trajectory would be beneficial, “because of the shock - the isolation as well” (Jeremy). Some men suggested technical improvements, such as a placeholder or bookmark-type function, more detailed progress indicators for both the questionnaires and modules, and the need to stay on top of browser upgrades.

Insert table 2 here

## Discussion

The findings from this study suggest that e-TC is a feasible and acceptable platform for delivering information and psychological support to men treated for TC. Further, the feasibility data, program satisfaction ratings and qualitative feedback provide a rich bank of information to direct study design and revisions of the website content and structure for the next phase of e-TC program evaluation: further feasibility and efficacy testing in TC survivors reporting borderline/clinical levels of anxiety or depression.

A key aim in developing e-TC was to overcome identified barriers to support-seeking in this population. e-TC was reported to address a number of unmet needs and barriers to seeking support that have previously identified as relevant for this population (Bender et al., 2012; Gulliver et al., 2010; Jonker-Pool et al., 2004; Smith et al., 2013). Although some participants found making time to use the intervention difficult, being able to access support from home or through a mobile device precludes the need to spend time travelling to and from appointments and allows participants to access the intervention at any time and for little cost. More importantly, participants reported that e-TC reduced the stigma of mental health issues, by normalising men’s feelings, and overcame embarrassment by providing privacy in help-seeking, thus providing information and support in a manner consistent with masculine ideals (Galdas et al., 2014). Participants also reported valuing the inclusion via videos of other men’s stories and experiences of coping with TC. Men also appreciated an intervention specifically tailored to their disease, and found it personally relevant to their experience.

The need for self-management interventions to fit with masculine ideals, such as self-sufficiency and stoicism, is directly addressed by online interventions that allow men to self-manage their problem in a way that is convenient and confidential, appealing to their sense of toughness and self-reliance (Galdas et al., 2014). e-TC was designed to provide men with choice over which modules to view and in what order, allowing them to pursue health agendas of concern to them and to get what they needed out of the intervention in a way that they felt

comfortable with. Galdas et al. (2014) note that consultation with male consumers of health services would help increase the congruence of services with central aspects of their identities and their appeal to such consumers, in general. Our approach was directly in line with this recommendation, as we had several TC survivors on the project team in order to maximize the likely relevance and usefulness to other TC survivors. Further, research suggests that men value self-management interventions that involve and/or are facilitated by men with a shared illness experience (Galdas et al., 2014). While we did not include a forum or peer support component that allowed men to directly interact with one another, we did include multiple survivor videos where TC survivors talked about their experience and how they dealt with it, as a way of promoting shared understanding, connectedness and normality (Galdas et al., 2014). This component of e-TC was highly-valued by the participants in our pilot study.

Lack of time was the most common reason given for non-participation or non-completion, an issue which has been identified in other online intervention studies (e.g., Fergus et al., 2014). Qualitative data suggested that if e-TC was made available closer to the time of diagnosis when need is perceived to be greater, men may be more motivated to make time. However research does not appear to provide strong support for this hypothesis, with similar rates of engagement evident in studies which delivered the intervention earlier. For example, a recent large-scale evaluation of Finding My Way (Beatty et al., 2015), an online intervention for coping with a recent ( $\leq 6$  months ago) cancer diagnosis (any cancer type) and/or current treatment, found that 63% of participants completed what was considered to be a therapeutic dose of the intervention (i.e., completed 4/6 modules) (L. Beatty and E. Kemp, personal communication, 5/4/2016). However it is possible that some modules of Finding My Way were more relevant for some participants than others. For example, participants particularly interested in the module on *Starting Treatment* may be less likely to use the module on *Completing Treatment*, and vice versa. In fact, Finding My Way gave participants the option to reorder the modules according to their preferences/relevance. Thus users of online interventions may prioritise accessing only information deemed immediately and personally relevant, a point made by a number of e-TC pilot participants, suggesting that completion rates may not be a good indicator of program acceptability and feasibility.

Nevertheless, in the current study the majority of men who completed less than 20% of the program reported no distress on the thermometers while the majority of men who completed at least 80% reported at least some distress. Therefore, it is possible that men actively seeking psychological support would be more likely to commit the time required to complete the program. The next phase of e-TC evaluation will recruit men with borderline/clinical anxiety or depressive (HADS subscale score  $\geq 8$ ) symptom levels who



completed TC treatment more recently, and additional functionality will enhance site navigation to facilitate access to intervention content on a need basis.

Participants were satisfied with e-TC in general. The highest program satisfaction rating was for e-TC's ease of use, suggesting that the structure of the program and its navigation require little revision and that efforts to improve e-TC should focus more on other aspects. e-TC will be revised to include detailed tailoring of presented information and additional information that can be accessed by those seeking it. Where possible, information will be presented in video format, consistent with participant feedback. Efforts will also be made to enhance the flexibility of program use (for men to be able to log in and locate specific information easily) through bookmarking and search functions.

A key limitation of this study is that the sample is unlikely to be representative of all men who have undergone TC treatment; they were primarily urban and motivated to help with research. The next step, an efficacy study, will require the recruitment of men with elevated levels of distress, across stage of disease, at varying times post-treatment and across the rural/regional divide.

## Conclusions

e-TC appears to provide a feasible and acceptable psychological treatment option for men who are experiencing difficulties in adjusting to challenges following treatment for TC. Satisfaction with e-TC was moderately high and useful feedback on various aspects of program design will be utilised to refine e-TC. Key highlights of the program were the survivor videos, and the reports that it was comprehensive and easy to use. Other features including some of the interactive, treatment-specific components will be modified to improve user engagement with the content. The next step is to refine e-TC based on feedback and evaluate in a sample of TC survivors with elevated distress, and assess potential efficacy.

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Table Legend.

Table 1. Overview of topics covered and skills taught in e-TC modules

Table 2. Satisfaction outcomes

Figure Legend.

Figure 1. e-TC dashboard

Table 1. Overview of topics covered and skills taught in e-TC modules

Module number	Module name	Topics covered	Skills/exercises
1	Foundations:	Normalises reactions to TC and its treatment	Identifying and challenging unhelpful thoughts
	Putting together a toolkit to manage stress and worry	Introduces key skills (e.g. mindfulness)	Mindfulness
2	After treatment:	Emotional impact of TC (e.g. anxiety, depression, FCR, anger)	ACT <sup>1</sup> principles of defusion, acceptance and connection
	How you feel after treatment for TC	Normalises emotional reactions	Revisits mindfulness
3	Changes: Physical changes and side effects	Information about changes and side effects by treatment type:	Relaxation techniques
		1. orchidectomy	Introduction to Tai Chi and Qi Gong
		2. chemotherapy/radiotherapy	Revisits identifying and challenging thoughts
		3. node dissection and other surgeries	Revisits acceptance
4	Being a 'man':	Effect of TC and its treatment on masculinity and sexuality	Revisits identifying and challenging thoughts
	Masculinity and sexuality	Acknowledges changes and loss Dispels myths and stereotypes	
5	Significant others:	Explores potential impact of TC and its treatment on	Listening skills
	Relationships and communication	relationships with current/future partners, family and friends Enhancing communication	Assertive communication

6	Moving forward: Life after TC	Information about survivorship issues (e.g. existential concerns, FCR, physical health, practical concerns) and practical strategies for managing concerns	Identifying values Therapeutic writing Detached mindfulness Worry postponement Problem solving Goal setting Benefit finding
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<sup>1</sup>ACT – Acceptance and Commitment Therapy (Hayes, Luoma, Bond, Masuda & Lillis, 2006)

Table 2. Satisfaction outcomes

	Overall (n=17)	Module 1 (n=17)	Module 2 (n=17)	Module 3 (n=15)	Module 4 (n=15)	Module 5 (n=8)	Module 6 (n=9)
Outcome	Mean (SD)						
Acceptable	8.8 (1.2)	7.9 (1.4)	8.1 (1.2)	8.5 (1.4)	7.4 (2.7)	7.2 (3.1)	9.0 (0.9)
Useful	8.1(1.9)	7.5 (1.7)	7.8 (1.5)	8.0 (1.6)	7.4 (2.1)	7.6 (2.0)	8.4 (1.2)
Comprehensive	8.9 (1.2)	8.1 (1.1)	8.2 (1.4)	8.3 (2.0)	8.1 (1.7)	8.1 (2.0)	9.0 (1.0)
Relevant	8.5 (1.2)	7.7 (2.0)	7.5 (2.0)	8.3 (1.7)	7.8 (1.9)	8.0 (1.6)	8.7 (1.2)
Helpful	7.9 (2.2)	7.7 (1.7)	7.5 (2.0)	8.4 (1.6)	7.8 (2.0)	8.0 (1.7)	8.9 (1.4)



Easy to use	8.5 (1.5)	8.4 (1.2)	7.9 (1.5)	8.6 (1.2)	8.4 (2.1)	8.8 (1.2)	8.7 (1.0)
<b>Total (% of possible total)</b>	<b>51 (84%)</b>	<b>47 (80%)</b>	<b>47 (78%)</b>	<b>50 (83%)</b>	<b>47 (78%)</b>	<b>48 (80%)</b>	<b>53 (88%)</b>
Length	6.7 (2.2)	5.8 (1.2)	6.1 (1.4)	4.9 (1.4)	5.2 (1.8)	5.0 (1.4)	5.7 (1.7)

Range for all outcomes 0-10, with 0=not, 10=very, except for length where 5 represented “just right”, 0 was “too short” and 10 was “too long”

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