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Logging into therapy: Parent attitudes and intentions to use computer-based therapies for youth mental health



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ABSTRACT

Objectives: The first aim of this study was to describe parental attitudes towards and intentions to access, computer-based therapies for youth mental health problems. The second aim was to assess parental factors (demographic and clinical factors, personality, technology factors, mental health knowledge and attitudes, and knowledge of computer-based therapies) predicting attitudes and intentions to access computer-based therapies for youth.

Method: Three hundred and seventy-three Australian parents completed an online survey measuring: demographics; mental health service experience; personality; technology factors; mental health knowledge and attitudes; perceived benefits, problems, and helpfulness of computer-based therapies; and intentions to access services.

Results: Approximately 50% of parents reported accessing support for their child's mental health, yet only 6% had used a computer-based therapy. The majority of parents strongly endorsed all benefits of computer-based therapies, and appeared relatively less concerned by potential service problems. Computer-based therapies were perceived as *somewhat to extremely helpful* by 87% of parents and 94% indicated that they would utilise a computer-based therapy if their child required support and one was offered to them. Parental knowledge of computer-based therapies significantly predicted perceived helpfulness ($\Delta F = 19.23$ (1301), $p = <.001$) and intentions to access ($\Delta F = 10.91$ (1288), $p = .001$) computer-based therapies, above that of parent demographic characteristics, clinical factors, and engagement with technology.

Conclusions: Australian parents hold positive attitudes to the use of computer-based therapies.

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1. Introduction

Despite advancements in evidence-based treatments, youth mental health problems remain prevalent. Only 46.1% of Australians with a mental illness receive mental health services (Whiteford et al., 2014) and young people are among those least likely to access support (Slade et al., 2009). Computer-based therapies are well placed to improve access to evidence-based interventions for mental health problems in youth and circumvent many of the barriers to accessing treatment (Elkins et al., 2011). There is a growing body of research supporting the efficacy of computer-based therapies for young people across a variety of mental health problems (Donovan & March, 2014; Spence et al., 2011; Grist & Cavanagh, 2013; Sethi, 2013) with computer-based therapies demonstrating comparable levels of effectiveness to face-to-face interventions (Barak et al., 2008; Christensen

et al., 2014; Grist & Cavanagh, 2013). Unfortunately, the uptake of these programmes has been recognised as being low in the past (Gun et al., 2011) and little is known about programme uptake within child and adolescent populations.

There are many factors that may contribute to the poor uptake of computer-based therapies. The theory of planned behaviour (Ajzen, 1985) emphasizes the role of attitudes in predicting behavioural intentions, which are in turn influenced by individual characteristics, knowledge, perceived benefits, and perceived problems. There is limited research exploring attitudes towards computer-based therapies for the treatment of mental health problems in young people, with the majority of studies focusing on the perceptions of mental health clinicians and the attitudes of consumers/clients themselves being relatively ignored. Clients of these services not only include young people, but also their parents who act as gatekeepers for child access to mental health support.

Apart from studies which have examined consumer feedback on specific interventions for programme development or pilot trial (Cunningham et al., 2006; Salloum et al., 2013), there is only one

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study that has examined attitudes of youth towards computer-based therapies generally. Horgan and Sweeney (2010) examined the attitudes of university students (aged 18–24 years) in the United Kingdom and found that the majority of students were willing to access mental health services online, with a third having done so already, and two thirds reporting that they would if they needed to. However, four out of five students reported a preference for traditional face-to-face support if both modes of therapy were available. Students who preferred internet support indicated that anonymity, privacy, confidentiality, accessibility, speed and cost were the greatest perceived benefits. Evidently, the only study that has examined attitudes towards computer-based therapies for youth mental health generally, has sampled young adults, not youth or their parents. Research conducted to date is therefore limited in its capacity to advance our understanding of consumer attitudes towards these services.

Although in its infancy, research in this area is important, as the results may be used to inform effective models of dissemination and targeted promotion aimed at increasing the uptake of computer-based therapies, so that children and adolescents can ultimately benefit from improved access to effective psychological services. Research in this area may also inform the design and development of future computer-based therapy programmes. The current study sought to explore parental perceptions about computer-based therapy for their children, as parents are typically the primary gatekeepers for child and adolescent mental health services. Parental attitudes towards support services can therefore either promote or hinder the uptake of programmes by young people. To the authors' knowledge, there has been no research conducted to date that has explored parental perceptions of these services, exclusive of user feedback on a specific intervention programme (Salloum et al., 2013). In addition to investigating the content of parental attitudes, it is also important to examine factors that may influence these attitudes towards computer-based therapy for youth.

The limited research conducted in the adult literature suggests that factors such as personality and use of technology may impact on attitudes towards computer-based therapies. For example, Klein and Cook (2010) found that lower trait loading on extraversion, neuroticism, agreeableness, and openness to experience was linked to adults' preference for e-therapies, although neuroticism was not related to preference in a study of young people conducted by Tsan and Day (2007). Greater technology access and higher computer fluency have also been linked with more positive clinician attitudes towards computer-assisted therapies for adult clients (Becker & Jensen-Doss, 2013), although no differences in technology access between those preferring 'e' versus 'non-e' therapies were found by Klein and Cook (2010).

Mental health knowledge and attitudes are positive predictors of help-seeking in traditional mental health services (Cometto, 2014; Jorm, 2012). Following this, there is preliminary yet consistent evidence to suggest that knowledge of, and experience with, computer-based therapies is also associated with higher intended uptake. Mental health professionals who had been exposed to computer-based therapies have been found to perceive more benefits for their use in child and adolescent populations (Fleming & Merry, 2013). Furthermore, it has been demonstrated that previous users of, and those with knowledge of, internet-based programmes provide higher ratings of acceptability and greater intentions to use computer programmes compared to those with no prior experience or with limited knowledge (Gun et al., 2011; Klein and Cook, 2010). Thus, it seems logical, and indeed suggested by researchers (e.g. Carper, McHugh & Barlow, 2013) that a pronounced lack of exposure to computer-based therapies could account, at least in part, for the low rates of uptake found.

It is evident that there is a shortage of empirical research examining predictors of attitudes and intended uptake of computer-based therapies and a complete absence of such research examining parental and youth predictors. What is available in the clinician and adult literature suggests that personality, technology factors, mental health knowledge

and attitudes, and knowledge of computer-based therapies may be influential to attitudes and worthy of investigation.

The first aim of the current study was to describe in a quantitative manner, parental attitudes towards computerised therapy for youth, such that the child or adolescent is completing the therapy programme. Attitudes described included 1) perceived benefits of computer-based therapies, 2) perceived problems with computer-based therapies, 3) perceived helpfulness of computer-based therapies, and 4) intentions to access computer-based therapies for their children. Parental recommendations for the availability of computer-based therapies for youth were also of interest. The second aim of this study was to assess parental factors predicting attitudes and intentions to access computer-based therapies for youth. Parental factors of interest include 1) demographics, 2) personality, 3) technology factors, 4) mental health knowledge and attitudes, and 5) knowledge of computer-based therapies.

2. Method

2.1. Participants

Participants were parents who had at least one child aged 0–18 years old. Participants were 373 parents aged 18–56 years ($M = 36.01$, $SD = 7.27$), of whom $n = 329$ (88.2%) were female. Table 1 provides the demographic characteristics of participants. As is evident, the majority of participants resided in an urban locality, were married or in a de facto relationship, were currently engaged in study and some form of employment, and had completed tertiary education. The majority of participants' partners were in full-time employment and had a combined household annual income of less than \$100,000.

The characteristics of participants' children were also reported. All participants had at least one child aged 0–18 years old. In total, all children of participants (i.e. not a target child) were aged between 0 and 28 years ($M = 8.26$, $SD = 6.06$), and 53.1% ($n = 405$) were male. The majority of parents reported having one or two children ($M = 2.05$, $SD = 1.05$). In total, 66.0% ($n = 246$) of parents reported at least one child with a current or past mental health problem, the most prevalent of which were anxiety ($n = 146$, 39.1%), behavioural problems ($n = 114$, 30.6%), bullying ($n = 89$, 23.9%), depression/mood ($n = 58$).

Table 1
Participant demographics.

Category	Group	n	%
Residential location ^b	Urban	302	82.1
	Rural	66	17.9
	Nil	91	24.4
Study ^a	Casual/part-time	135	36.2
	Full-time	147	39.4
	Unemployed	115	30.8
Employment ^a	Casual/part-time	150	40.2
	Full-time	108	29.0
	Secondary	72	19.3
Highest level of education ^a	Tertiary	244	65.4
	Post-graduate	57	15.3
	Married/defacto	266	71.3
Relationship ^a	Single-separated/divorced	58	15.5
	Single-never married	47	12.6
	Other	2	0.5
	Unemployed	26	9.8
Partner's employment ^c	Casual/part-time	28	10.6
	Full-time	211	79.6
	Secondary	56	21.1
Partner's highest level of education ^c	Tertiary	183	69.1
	Post-graduate	26	9.8
	Less than \$60,000	141	37.8
	\$61,000–\$100,000	93	24.9
Household annual income ^a	\$101,000–\$140,000	79	21.2
	Greater than \$141,000	90	16.1

^a $n = 373$.

^b $n = 368$.

^c $n = 265$.

15.5%), and learning difficulties ($n = 55$, 14.7%). Problems reported less frequently included grief ($n = 42$, 11.3%), Attention Deficit Hyperactivity Disorder (ADHD; $n = 34$, 9.1%), Autism Spectrum Disorders (ASD; $n = 27$, 7.2%), and trauma ($n = 26$, 7.0%).

2.2. Procedure

Ethical clearance was granted prior to the commencement of data collection. Participants were recruited from an Australian community population via social media promotion, in addition to direct advertising through parenting groups, childcare centres, and schools. All recruitment materials provided potential participants with a link to access the online information/consent form and survey site. After providing informed consent, participants completed an anonymous online questionnaire battery and were offered the opportunity to submit their email address separately so that they could be entered into the draw to win an iPad Mini or one of two AUD\$100 gift-vouchers. All participants were invited to contact the researchers or to view the projects' social media website for a summary of results from the study.

2.3. Measures

The following section details the measures used in the current study. Given research in this area is in its infancy, there is an absence of psychometrically validated measures available to measure constructs specific to 1) the unique services of computer-based therapies, and 2) the unique perspectives that parents may have regarding the use of these services for their children. Subsequently, this study employed a number of author-developed measures that were adapted from previous research and/or developed in consultation with colleagues in field of computer-based therapies. Reliability estimates for each of these measures based on the current sample are provided in Table 3.

2.3.1. Demographics

Parents reported their age, gender, residence locality, employment and education, relationship status, partner details, and household income. Parents also reported on the age, gender, and presence or history of emotional or behavioural difficulties of each of their children.

2.3.2. Mental health experiences

A 14-item questionnaire was developed by the authors to measure parental experiences with mental health services. Parents were asked to report whether they had accessed 1) *any* support and 2) a *computer-based therapy* for emotional or behavioural problems for their child(ren) (*yes/no*). Subsequent items asked parents to rate how helpful they found a range of 11 mental health services (e.g., 'Psychologist' and 'Online counselling') on a three-point Likert scale (1 = *helpful*, 2 = *not helpful*, 3 = *harmful*). Finally, parents were asked to indicate the type of intervention they had accessed for their child(ren) from a list of possible approaches (e.g., 'Cognitive Behaviour Therapy' and 'Acceptance Commitment Therapy').

2.3.3. Personality

The 44-item Big Five Inventory (BFI; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) was administered to parents to measure parent personality style. The BFI comprises 5 subscales: Extraversion (8-items), Agreeableness (9-items), Conscientiousness (9-items), Neuroticism (8-items), and Openness (10-items). Higher scores on each subscale indicate greater characteristic endorsement. Participants were asked to rate their agreement with each item on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The mean was calculated for each subscale to produce a scaled score ranging from 1 to 5. Previous research estimates the BFI subscales to have good internal consistency ($r = .83$) and convergent validity with other personality measures (John et al., 2008).

2.3.4. Technology factors

A brief three-item questionnaire was developed by the authors to measure parental technology factors. Parents were asked to indicate if they had access (1 = *yes*, 0 = *no*) to four common technologies (personal computer, internet, smartphone, and tablet) and to rate their confidence in the use of each of these technologies on a five-point Likert scale (1 = *not confident at all* to 5 = *very confident*). Access and confidence were described independently for each technology type. Parents were also asked to rate how much they like using new technologies in general on a single-item five-point Likert scale (1 = *strongly dislike* to 5 = *strongly like*).

2.3.5. Mental health knowledge

The Mental Health Knowledge Schedule (MHKS; Evans-Lacko et al., 2010) is a 12-item self-report questionnaire that was administered to measure parents' stigma-related knowledge of mental health issues. Participants were required to rate their agreement with each item on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Items include six statements about mental health (e.g., 'Most people with mental health problems want to have paid employment') and the classification of six ailments as mental illnesses (e.g., 'Please select how much you believe the following to be a type of mental illness'). All items were summed to provide a total score (ranging from 12 to 60), with higher scores indicating greater knowledge of mental health. Previous research indicates the MHKS has adequate to substantial internal consistency ($r = .54$ to $.69$) and test-retest reliability ($r = 0.57$ to 0.87) as well as expert endorsed face validity (Evans-Lacko et al., 2010).

2.3.6. Mental health attitudes

The 19-item Attitudes scale of the Mental Health Questionnaire (Sheffield, Fiorenza, & Sofronoff, 2004) was administered to parents to measure parental attitudes towards mental illness. The Attitudes scale is a modified version of the Opinions About Mental Illness (OMI) scale, previously used to assess mental health worker opinions around mental illness and modified to address outdated language and irrelevant items (Cohen & Struening, 1962). Parents were required to rate their agreement with each statement on a six-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*). Items were summed to provide a total score ranging from 19 to 114, with higher scores indicating more negative attitudes towards mental health. Prior estimates of the reliability of the 19-item scale are not available, though the scale showed high internal consistency in the present study (see Table 3).

2.3.7. Computer-based therapy knowledge

Parents were administered a 14-item true-false test developed by the authors to assess parental knowledge of computer-based therapies (e.g. 'All computer-based therapies involve therapist contact'; 0 = *incorrect*, 1 = *correct*). Responses were summed to produce a total score (ranging from 0 to 14), with higher scores indicating greater knowledge of computer-based therapies.

2.3.8. Computer-based therapy attitudes

Parental attitudes towards the use of computer-based therapies in the treatment of mental health problems were measured using an author-developed questionnaire adapted from previous research in the field (Stallard et al., 2010; Klein & Cook, 2010). The questionnaire included three scales: perceived problems with computer-based therapies (10-items), perceived benefits of computer-based therapies (9-items), and perceived helpfulness of computer-based therapies (1-item)

2.3.8.1. Perceived problems. Perceived problems with the use of computer-based therapies were measured with a 10-item scale whereby parents were required to rate the degree to which they thought each item was problematic on a five-point Likert scale (1 = *extremely problematic* to 5 = *not at all problematic*). Responses were summed to

produce a total score that could range from 10 to 50, with higher scores indicating fewer perceived problems with computer-based therapies (i.e. more positive attitudes).

2.3.8.2. Perceived benefits. Perceived benefits of computer-based therapies were measured with a 9-item scale whereby parents were required to rate the degree to which they thought each item was beneficial on a five-point Likert scale (1 = *not at all beneficial* to 5 = *extremely beneficial*). Responses were summed to produce a total score that could range from 9 to 45, with higher scores indicating greater perceived benefits of computer-based therapies.

2.3.8.3. Perceived helpfulness. Participants rated how helpful they considered computer-based therapies to be in the treatment of emotional and behavioural difficulties, on a single-item five-point Likert scale (1 = *not helpful at all*, to 5 = *extremely helpful*).

2.3.9. Recommended availability

Parents were asked their opinions on the different ways computer-based therapies could be made available for young people to access. Participants rated their level of endorsement of six availability options (i.e. Computer-based therapies should be: 'Available for use in school' and 'Only available with professional support'). Responses were scored on a five-point Likert scale (1 = *definitely no* to 5 = *definitely yes*) and were used for descriptive purposes only.

2.3.10. Intentions to access services

Parents completed a 5-item author-developed questionnaire about their intentions to access mental health services for their child(ren), that was adapted from previous research in the field (Stallard et al., 2010; Klein & Cook, 2010). The first four items were reported descriptively and the final item was used in quantitative analyses. The first item asked participants to rate how likely they would be to use a range of 11 mental health services for their child(ren) (e.g., 'Psychologist' and 'Online counselling') on a five-point Likert scale (1 = *not at all likely* to 5 = *extremely likely*). The second item asked participants whether they would access an available computer-based therapy programme if their child experienced an emotional or behavioural difficulty (*yes/no*). In line with Klein & Cook (2010), the third item asked participants to choose a preference between using face-to-face or computer-based therapy in the event of their child demonstrating an emotional or behavioural problem. The fourth item asked parents to indicate their preferred modes of access to computer-based therapies (i.e. 'smartphone', 'tablet', 'CD-ROM', 'internet', and 'virtual reality'), with the option to select multiple modes. A single-item was used to quantitatively measure parental intentions to access a computer-based therapy if their child experienced an emotional or behavioural difficulty. Responses were scored on a five-point Likert scale (1 = *not at all likely* to 5 = *extremely likely*).

2.4. Data analytic plan

The analyses were divided into two major sections corresponding to the two aims of the study. The first aim of the study was to describe the ways in which Australian parents perceive the use of computer-based therapies for youth with mental health concerns. Descriptive statistics were used to explore 1) mental health service experience, 2) technology factors, 3) knowledge of computer-based therapies, 4) attitudes towards computer-based therapies, and 5) intentions to access services.

The second aim of the study was to assess parental factors predicting attitudes and intentions to access computer-based therapies. A series of four hierarchical multiple regression analyses (HMRs) were conducted, one for each of the four outcome variables (perceived helpfulness, problems, benefits, and intentions to access computer-based therapies). Parental factors investigated included demographic and clinical factors

(parent gender, parent age, residential location, number of children, presence of child mental health problems, and experience with computer-based therapies), technology factors (liking, access, and confidence), knowledge of computer-based therapies, mental health factors (mental health knowledge and mental health attitudes), and personality factors (extraversion, agreeableness, conscientiousness, neuroticism, and openness). The order of entry of these variables was determined in order to control for extraneous predictors (step one: demographic and clinical factors), highlight factors presumed to be of higher importance to parental attitudes (step two: technology factors, step three: knowledge of computer-based therapies), and examine the additional predictive value of variables explored in prior research (step four: mental health factors, step five: personality factors).

Power analyses for the study were conducted using G*Power (Erdfelder, Faul, & Buchner, 1996). In order to detect a medium effect size with alpha of $p = .05$ and power = .80, with 17 predictor variables, a sample size of 146 is required; while a sample size of 1000 is required to detect a small effect size with the same parameters. Therefore, the current sample of 373 participants may be sufficiently powered to detect a medium to small effect, but underpowered to detect a very small effect.

3. Results

3.1. What are parents' experiences and attitudes towards computer-based therapies?

3.1.1. Mental health service experience

Parents reported their prior use of mental health services for their children.¹ Half of the parents ($n = 181$, 50.7%) reported accessing at least one form of support for their child's mental health concern, most commonly information websites ($n = 135$, 37.8%), GP ($n = 124$, 34.7%), self-help books ($n = 115$, 32.2%), psychologists ($n = 97$, 27.2%), and counsellors ($n = 93$, 26.1%). Only 4.2% ($n = 15$) of all parents had previously accessed a computer-based therapy with therapist assistance for their child, while only 2.2% ($n = 8$) of all parents had previously accessed a computer-based therapy without therapist assistance for their child.

The majority of parents who had accessed a mental health service for their child perceived the service as helpful, although online counselling was seen as less useful. Of parents who had accessed at least one service for their child's mental health ($N = 181$), the most common types of therapy accessed were supportive counselling ($n = 73$, 40.3%), CBT ($n = 51$, 28.2%), mindfulness ($n = 41$, 22.7%), and family therapy ($n = 31$, 17.1%). One in three parents ($n = 55$, 30.4%) who had accessed a mental health service indicated that they were unsure about what type of therapy was involved.

3.1.2. Technology Factors

Parents were asked to report their household technology access as well as their confidence and liking in the use of technology. All parents reported household access to at least one type of technology, including personal computers ($n = 329$, 97.3%), internet access ($n = 333$, 98.5%), smartphones ($n = 306$, 90.5%), and tablets ($n = 229$, 67.8%). The majority of parents indicated that they were *confident* or *very confident* using personal computers ($n = 324$, 95.6%), the internet ($n = 325$, 95.9%), smartphones ($n = 292$, 86.2%), and tablets ($n = 259$, 76.4%). In addition, the majority of parents reported *strongly liking* ($n = 174$, 51.3%) or *liking* ($n = 133$, 39.2%) technology in general, with fewer parents endorsing *neutral* ($n = 29$, 8.6%), *dislike* ($n = 2$, 0.6%), or *strongly dislike* ($n = 1$, 0.3%) in relation to technology use.

¹ Contact the authors for additional details.

3.1.3. Computer-based therapy knowledge

Parents completed a 14-item quiz regarding their knowledge of computer-based therapies.² The interactivity of computer-based therapies was most well-known, identified correctly by 47.6% ($n = 158$) of parents. The following features were also correctly identified by approximately a third of parents: variability in level of therapist contact (35.5%, $n = 118$), effectiveness with adolescents and children (29.8%, $n = 99$), and availability online and offline (28.6%, $n = 95$). Only one in five parents correctly identified computer-based therapies as effective treatments of anxiety (21.4%, $n = 71$) and depression (19.0%, $n = 63$).

3.1.4. Computer-based therapy attitudes

Parent attitudes towards the use of computer-based therapies were reported in terms of perceived problems, perceived benefits, and perceived helpfulness.³

3.1.4.1. Perceived problems. Parents were asked to rate ten potential problems with computer-based therapies for child mental health. Issues most frequently rated as *moderately* or *extremely problematic* included: not being tailored to individual needs (33.9%, $n = 107$), the privacy and security of personal information (33.2%, $n = 105$), lack of therapist contact (33.2%, $n = 105$), children not completing the treatment programme (32.0%, $n = 101$), and technological problems (29.1%, $n = 92$). Parents appeared less concerned by problems with computer access (24.4%, $n = 77$), availability of additional explanations when required (23.4%, $n = 74$), appropriateness of tasks (18.0%, $n = 57$), child engagement (14.9%, $n = 47$), and finding the time to complete programmes (14.9%, $n = 47$).

3.1.4.2. Perceived benefits. Parents also rated nine potential benefits of computer-based therapy for children. Overall, the following benefits of computer-based therapies assessed were considered *extremely* or *moderately beneficial* by at least three in every four parents: use at any time (87.7%, $n = 277$) and at home (87.3%, $n = 276$), ease of accessibility (86.4%, $n = 273$), interactivity (80.7%, $n = 255$), ability to monitor children's progress (80.7%, $n = 255$), cost affordability (79.7%, $n = 252$), and earlier access to treatment (78.5%, $n = 248$). Stigma reduction (66.5%, $n = 210$) and child engagement (59.8%, $n = 189$) were also rated as *extremely* or *moderately beneficial* by the majority of parents, although to a lesser extent.

3.1.4.3. Perceived helpfulness. In total, the majority of parents believed that computer-based therapies were *somewhat* ($n = 128$, 40.4%), *moderately* ($n = 107$, 33.8%), or *extremely helpful* ($n = 42$, 13.2%) in supporting children with mental health challenges. Few parents rated computer-based therapies as *slightly helpful* ($n = 38$, 12.0%) or *not helpful at all* ($n = 2$, 0.6%).

3.1.5. Recommended availability

Table 2 outlines parental beliefs around the availability of computer-based therapies to families. The majority of parents felt that computer-based therapy should be available (i.e. *yes/definitely yes*) in mental health clinics, schools, GP clinics, and on the internet. With respect to the level of therapist support, parents most strongly supported computer-based therapy with professional support compared to programmes that were entirely self-help, although more than one in three parents were unsure (i.e. *maybe/neutral*).

3.1.6. Intentions to access services

Parents were asked to predict their intentions to access services in the context of their child experiencing an emotional or behavioural

Table 2

Parent recommended availability of computer-based therapies ($n = 317$).

Availability	Definitely no/no		Maybe/neutral		Yes/definitely yes	
	n	%	n	%	n	%
Freely available on the internet	29	9.2	73	23.0	215	67.8
Available for use in schools	8	2.5	47	14.8	262	82.7
Available in GP clinics	8	2.5	56	17.7	253	79.8
Available in mental health clinics	1	0.3	27	8.5	289	91.2
Available without professional support	123	38.8	121	38.2	73	23.0
Only available with professional support	50	15.8	112	35.3	155	48.9

difficulty. The majority of parents reported that they would access a computer-based therapy ($n = 286$, 94.1%). One third of parents ($n = 100$, 32.9%) reported that they were *extremely likely* to access a computer-based therapy for their child if available, 33% ($n = 99$) were *moderately likely*, 2.4% ($n = 68$) were *somewhat likely*, 7.2% ($n = 22$) were *slightly likely* and 4.9% ($n = 15$) were *not at all likely* to do so. Furthermore, one in four parents reported that they would choose a computer-based therapy ($n = 78$, 25.7%) over a face-to-face ($n = 226$, 74.3%) alternative. In order of preference, parents endorsed accessing computer-based therapies through the internet ($n = 241$, 79.3%), tablets ($n = 162$, 53.3%), smartphones ($n = 77$, 25.3%), virtual reality programming ($n = 55$, 18.1%), or CD-ROM ($n = 50$, 16.4%).

Fig. 1 illustrates reported parental likelihood of use for a variety of different service types. The highest rates of *extremely likely* service use were reported for GPs ($n = 148$, 48.7%) and information websites ($n = 145$, 47.7%), followed by psychologists ($n = 117$, 38.5%) and counsellors ($n = 101$, 33.2%). In contrast, the lowest rates of *extremely likely* service use were reported for phone counselling ($n = 19$, 6.3%) and prescribed medication ($n = 23$, 7.6%), followed by computer-based therapy without therapist assistance ($n = 39$, 12.8%) and online counselling ($n = 41$, 13.5%). The majority of parents still reported being at least *somewhat likely* to access a computer-based therapy in the future and favoured use with therapist assistance.

3.2. What factors predict parents' attitudes and intentions to access computer-based therapies?

Table 3 provides the means, standard deviations, bivariate correlations and alphas for all variables used in the analyses.

Table 4 provides the statistics for the final model (step five) of each HMR examining the impact of parent factors on the following outcome variables: perceived helpfulness, perceived problems, benefits, and intentions to access computer-based therapies.⁴ Parental predictors are grouped in order of entry: demographic and clinical factors (1), technology factors (2), knowledge (3), mental health factors (4), and personality factors (5).

3.2.1. Perceived helpfulness

The final regression equation accounted for 20% of the variance in parents' perceived helpfulness of computer-based therapies, $R^2 = .20$, $F = 4.20$ (17,294), $p < .001$. Technology factors ($\Delta R^2 = .04$, $\Delta F(3302) = 4.77$, $p = .003$), knowledge of computer-based therapies ($\Delta R^2 = .06$, $\Delta F(1301) = 19.23$, $p < .001$), and mental health factors ($\Delta R^2 = .03$, $\Delta F(2299) = 5.95$, $p = .003$) contributed significantly to the model. In the final model, prior experience with computer-based therapies, greater technology liking, greater knowledge of computer-based therapies, less stigmatised mental health attitudes, and greater agreeableness and neuroticism, significantly predicted greater perceived helpfulness of computer-based therapies.

² Contact the authors for additional details.

³ Contact the authors for additional details.

⁴ Contact the authors for additional details.

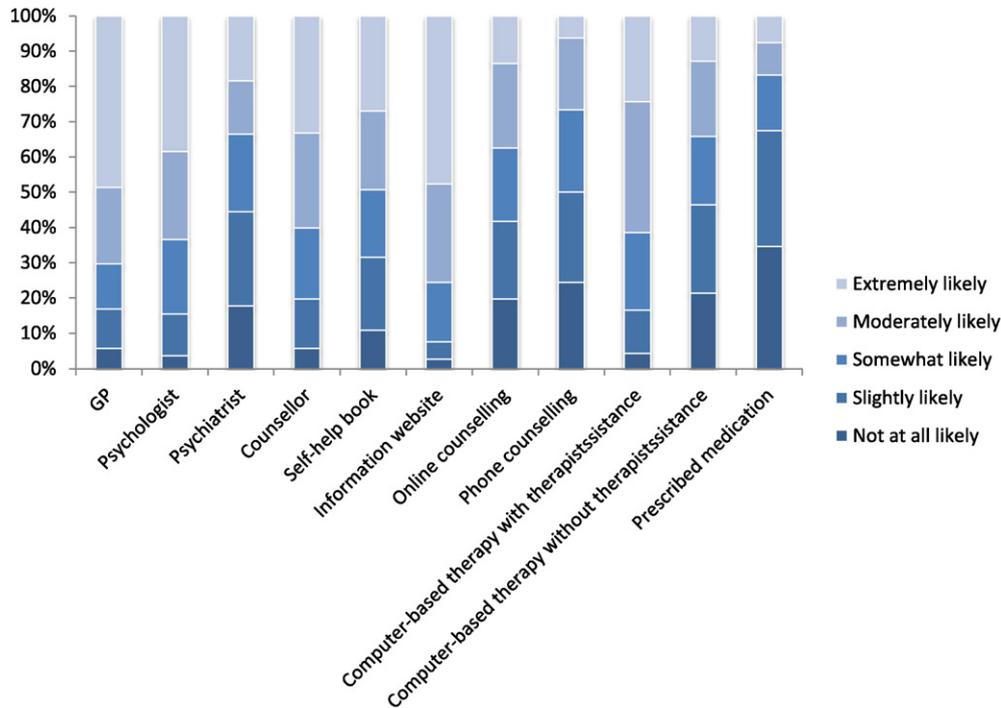


Fig. 1. Likelihood of service use for future child emotional or behavioural difficulties by type of service.

3.2.2. Perceived problems

The final regression equation accounted for 7% of the variance in parents' perceived problems with computer-based therapies, $R^2 = .07$, $F = 1.37$ (17,293), $p = .153$. Demographic and clinical factors ($\Delta R^2 = .04$, $\Delta F(6304) = 2.23$, $p = .040$) was the only step to contribute significantly to the model. In the final model, gender was identified as the only significant predictor of parent perceived problems with computer-based therapies, such that males perceived fewer problems than females.

3.2.3. Perceived benefits

The final regression equation accounted for 17% of the variance in parents' perceived benefits of computer-based therapies, $R^2 = .17$, $F = 3.48$ (17,293), $p < .001$. Demographic and clinical factors ($\Delta R^2 = .05$, $\Delta F(6304) = 2.43$, $p = .026$), technology factors ($\Delta R^2 = .03$,

$\Delta F(3301) = 3.27$, $p = .022$), and mental health factors ($\Delta R^2 = .07$, $\Delta F(2298) = 12.61$, $p < .001$) contributed significantly to the model. In the final model, greater technology liking and less stigmatised mental health attitudes significantly predicted greater perceived benefits of computer-based therapies.

3.2.4. Intentions to access

The final regression equation accounted for 16% of the variance in parents' intentions to access computer-based therapies, $R^2 = .16$, $F = 3.24$ (17,281), $p < .001$. Demographic and clinical factors ($\Delta R^2 = .05$, $\Delta F(6292) = 2.55$, $p = .020$), technology factors ($\Delta R^2 = .04$, $\Delta F(3289) = 3.88$, $p = .010$), and knowledge of computer-based therapies ($\Delta R^2 = .03$, $\Delta F(1288) = 10.91$, $p = .001$) contributed significantly to the model. In the final model, greater technology liking, greater knowledge of computer-based therapies, less stigmatised mental health

Table 3
Descriptive statistics and bivariate correlations for all predictor and criterion variables.

		M	SD	α	Helpfulness	Problems	Benefits	Intentions to use
Demographic & clinical factors	Gender				-.01	-.09	.13*	.02
	Age	36.01	7.27		-.03	.13*	.57	-.02
	Location				-.08	-.06	-.14*	-.11
	Number of children	2.05	1.05		.04	.09	.10	.12*
	Child mental health problems	1.58	1.81		.07	.07	.07	.16**
	Experience with computer-based therapies				-.18**	-.07	-.02	-.13*
Technology factors	Technology liking	4.41	0.70		.21***	.07	.22***	.22***
	Technology access	3.54	0.67		.07	.02	.11*	.12*
	Technology confidence	17.78	2.78	.83	.18**	.04	.14*	.10
Knowledge	Knowledge of computer-based therapies	2.70	3.09	.85	.28***	.12*	.11*	.20***
Mental health factors	Mental health knowledge	47.42	4.07	.33	.12*	.04	.20***	.03
	Mental health attitudes	38.22	12.20	.87	-.23***	-.02	-.34***	-.20**
Personality factors	Extraversion	3.26	0.71	.84	-.03	.05	<.01	-.09
	Agreeableness	3.78	0.54	.78	.11*	.01	.14**	.07
	Conscientiousness	3.74	0.61	.84	.05	-.02	.06	-.05
	Neuroticism	3.03	0.68	.83	.11*	-.02	.08	.17**
	Openness	3.58	0.55	.78	.04	-.04	.15**	-.03
Criteria	M				3.47	33.10	37.89	3.81
	SD				0.89	7.54	6.67	1.12
	α					.86	.93	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, α = Cronbach's index of internal consistency.

Table 4
Statistics for the final regression equation (step five) examining parental predictors of outcome variables.

Group	Variable	Perceived helpfulness				Perceived problems				Perceived benefits				Intentions to access			
		β	<i>t</i>	<i>p</i>	<i>sr</i> ²	β	<i>t</i>	<i>p</i>	<i>sr</i> ²	β	<i>t</i>	<i>p</i>	<i>sr</i> ²	β	<i>t</i>	<i>p</i>	<i>sr</i> ²
1	Gender	-.08	-1.35	.179	<.01	-.13	-2.23	.027	.02	.06	1.04	.299	<.01	-.06	-1.09	.276	<.01
	Age	-.03	-0.56	.576	<.01	.11	1.69	.093	.01	.05	.81	.421	<.01	-.02	-.35	.728	<.01
	Location	-.01	-0.10	.920	<.01	-.04	-.64	.520	<.01	-.08	-1.41	.160	.01	-.04	-.61	.544	<.01
	Number of children	<.01	0.01	.990	<.01	.08	1.20	.231	.01	.03	.54	.590	<.01	.05	.74	.460	<.01
	Child mental health problems	.02	0.29	.774	<.01	.02	.22	.825	<.01	-.04	-.68	.499	<.01	.10	1.54	.125	.01
	Experience with computer-based therapies	-.13	-2.17	.031	.01	-.03	-.56	.579	<.01	.03	.54	.592	<.01	-.04	-.74	.461	<.01
2	Technology liking	.16	2.63	.009	.02	.06	.99	.324	<.01	.18	2.92	.004	.02	.17	2.74	.007	.02
	Technology access	-.08	-1.32	.187	<.01	.04	.53	.598	<.01	-.01	-.12	.905	<.01	.05	.71	.479	<.01
	Technology confidence	.10	1.55	.122	.01	.02	.26	.793	<.01	-.01	-.13	.896	<.01	-.01	-.19	.851	<.01
3	Knowledge of computer-based therapies	.23	4.12	<.001	.05	.09	1.48	.141	.01	.09	1.55	.122	.01	.19	3.29	.001	.03
4	Mental health knowledge	.06	0.93	.355	<.01	.02	.25	.807	<.01	.08	1.25	.214	<.01	-.04	-.69	.492	<.01
	Mental health attitudes	-.15	-2.44	.015	.02	-.05	-.69	.490	<.01	-.23	-3.66	<.001	.04	-.13	-2.08	.038	.01
5	Extraversion	.04	0.59	.558	<.01	.09	1.44	.151	.01	.01	.14	.892	<.01	<.01	-.06	.950	<.01
	Agreeableness	.14	2.34	.020	.01	.05	.76	.451	<.01	.07	1.15	.253	<.01	.14	2.33	.021	.02
	Conscientiousness	.03	0.59	.557	<.01	-.04	-.55	.581	<.01	.01	.19	.851	<.01	-.03	-.53	.599	<.01
	Neuroticism	.14	2.19	.029	.01	.00	.00	.998	<.01	.05	.78	.435	<.01	.14	2.11	.036	.01
	Openness	-.03	-0.56	.579	<.01	-.09	-1.38	.170	.01	.07	1.08	.281	<.01	-.07	-1.19	.236	<.01

attitudes, and greater agreeableness and neuroticism significantly predicted greater intentions to access computer-based therapies.

4. Discussion

The primary aims of this study were to describe the perceptions of Australian parents towards the use of computer-based therapies for children with mental health concerns, and investigate factors that might predict parental attitudes and intentions to access such services.

4.1. Parental experiences and attitudes towards computer-based therapies

Although half of parents disclosed accessing at least one form of support for their child's mental health, computer-based therapies were poorly utilised. However, information websites were the most commonly accessed service, suggesting that parents are using online resources to seek mental health support for their children. In addition, household technology access, parents' confidence, and parents' liking in the use of technology were all high. These results are promising and support the notion that computer-based therapies have the potential to slip seamlessly into the technology-savvy lifestyle of Australian families. Unfortunately, the rate of uptake found in this study suggests that this is yet to occur.

Following this, it is perhaps not surprising that parents' knowledge of computer-based therapies was found to be poor. Results suggested that four in five parents failed to identify computer-based therapies as effective treatments for anxiety and depression in young people. In addition, two of every three parents surveyed were seemingly unaware that computer-based therapies were available with varying levels of therapist contact. Evidently, many parents were uninformed about some of the key service features of computer-based therapies that may influence their perceptions. Yet, in spite of this, parental attitudes towards computer-based therapies were found to be predominantly positive.

Parental attitudes were explored in terms of perceived problems, perceived benefits, and perceived helpfulness of computer-based therapies. Problems with computer-based therapies were found to be of concern to fewer than one in three parents, including programmes not being tailored to individual needs, the privacy and security of personal

information, a lack of therapist contact, treatment non-completion, and technological problems. Similar factors have been reported as being of concern to clinicians (Stallard et al., 2010). In contrast, all perceived benefits of computer-based therapies were highly endorsed by parents, consistent with prior clinician attitude research (Stallard et al., 2010) and suggesting an overall positive impression of computer-based therapy. Specific benefits endorsed by parents related to accessibility, progress monitoring, interactivity, cost affordability, and earlier access to treatment. Interestingly, stigma reduction has been reported as a highly valued benefit of computer-based therapies by clinicians (Stallard et al., 2010), yet was not perceived to be of great benefit by parents. Finally, 87% of parents considered computer-based therapies to be helpful; markedly higher than the 56% of mental health clinicians who endorsed similar levels of helpfulness (Stallard et al., 2010). Overall, parents were optimistic about the use of computer-based therapies, despite poor knowledge of what these services can offer.

In terms of availability, parents strongly recommended that computer-based therapies should be made available through mental health clinics, schools, GP clinics, and online. These findings are not dissimilar to those reported by mental health professionals (Stallard et al., 2010). Parents were more supportive of programmes being offered with professional support, than without; although a third of parents were unsure on both, indicating that uptake may be improved if parents are educated around the variety of approaches available and encouraged to access a level of therapist support consistent with their needs and preferences.

Finally, when asked to predict future service use in the context of their child experiencing a mental health difficulty, 94% of parents indicated that they would utilise a computer-based therapy if it were offered. In contrast, prior research suggests that only 29% of mental health clinicians would *definitely*, and 50% would *possibly*, use computer-based therapies for youth (Stallard et al., 2010). This overwhelming response is particularly promising with respect to the potential uptake of computer-based therapies driven by parents. Even when asked to choose a preferred therapy option between traditional face-to-face and computer-based therapies, one in four parents maintained that they would log-in to therapy as a first-line treatment for their child.

4.2. Factors predicting attitudes and intentions to access computer-based therapies

In total, parent factors explained a significant proportion of the variance in parents' perceived helpfulness (20%), perceived problems (7%), perceived benefits (17%), and intentions to access (16%) computer-based therapies, suggesting that a number of factors are influential in predicting parents' perceptions of, and decisions around, using computer-based therapies for their children.

Individually, few demographic and clinical factors were found to influence parent attitudes. Only parents' gender and prior experience were related to attitudinal outcomes, such that males were found to perceive fewer problems with computer-based therapy than females, and parents with prior experience with computer-based therapies perceived them as more helpful. The impact of experience suggests that positive attitudes may be promoted through demonstrations that provide parents with exposure to therapy programmes. In addition, parents who liked using technology more also had more positive attitudes towards computer-based therapies, while the number of technological devices parents had access to and their overall confidence were not significantly influential. These findings are consistent with Klein and Cook (2010), who reported no differences in technology access between adults preferring 'e' versus 'non-e' therapies, yet are inconsistent with Becker and Jensen-Doss (2013), who found that greater technology access predicted more positive clinician attitudes towards computer-assisted therapies for adult clients.

Greater parental knowledge of computer-based therapies was also found to predict greater perceived helpfulness and access intentions, even after controlling for individual characteristics, prior experience, and engagement with technology. No prior literature is available analysing the relationship between knowledge of computer-based therapies and specific attitudinal outcomes; however, it has been suggested that adults may be cautious towards these services due to an absence of knowledge (Carper et al., 2013). Strategies aimed at improving parental uptake of computer-based therapies should be informative in nature, so as to educate parents on service benefits and usability and dispel ill-informed attitudes about potential problematic factors.

Unsurprisingly, less stigmatised attitudes towards mental health in general were found to predict greater perceived helpfulness, perceived benefits, and access intentions. While this study is the first to examine computer-based therapies specifically, these findings are consistent with mental health literature that indicate that help-seeking is hindered by stigmatised attitudes (Clement et al., 2015). It may therefore be that universal strategies aimed at reducing stigma will have a natural flow-on effect and promote the uptake of services, such as computer-based therapies. In contrast to mental health attitudes, parents' knowledge of mental health in general did not predict any outcomes. To date, no prior research has explored this link in relation to computer-based therapies. Perhaps general knowledge in mental health may not extend to an understanding of the differences in support options that would influence attitudes towards specific services. This difference in specificity may explain the discrepancy between the lack of association found here and the link between mental health knowledge and help-seeking found previously (Cometto, 2014; Jorm, 2012).

Finally, personality traits were found to be weak predictors of perceptions of computer-based therapies. Agreeableness and neuroticism were the only personality characteristics, found to positively predict perceived helpfulness and access intentions. Perhaps attributes associated with agreeableness, such as trust in services and pro-social responses, promote positive parental attitudes. Positive attitudes towards a treatment service may also be attributed to neurotic tendencies, such as elevated experiences of negative emotions and mental health problems. These findings are inconsistent with Klein and Cook (2010), who found higher agreeableness and neuroticism in non e-preferers, than e-preferers. No effects were found for extraversion,

conscientiousness, or openness, inconsistent with previous research that has found more positive attitudes in young adults with high levels of extraversion (Tsan & Day, 2007) and higher extraversion and openness in non e-preferers (Klein & Cook, 2010). Evidently, further research is required to clarify these relationships; however, it would seem from this study, that parents high in agreeableness and neuroticism may be more likely to support computer-based therapies. While targeting dissemination resources at specific parental personality traits is not likely to be feasible, these findings may inform clinicians' considerations on an individual client level, such that computer-based intervention referrals may be more suitable for parents high in agreeableness or neuroticism.

4.3. Strengths, limitations, and recommendations for future research

This study had a number of strengths. To the authors' knowledge, it was the first of its kind to quantitatively examine parental attitudes towards the use of computer-based therapies for child and adolescent mental health problems. In doing so, this study importantly recognised that parents are often the gatekeepers to accessing, or encouraging young people to themselves access, mental health support. In addition, this study extended beyond a preliminary illustration of parental attitudes and experiences with computer-based therapies, by including an assessment of factors predicting these attitudes. By highlighting important target factors, this is a small, but noteworthy step towards implementing evidence-based strategies to improve the uptake of computer-based therapies in young people. As a pioneering study in the population, this study also captured a broad array of variables that had the potential to predict parental attitudes, thus allowing future research to develop a more specific focus on influential variables only. The moderate sample size recruited and subsequent diverse distribution of parental demographics, also lends support for the generalisability of the findings of this study.

Despite this study's strengths, there were also limitations. First, the survey was only available online, therefore limiting the generalisability of results and potentially inflating the rate of technology access. Future research should aim to incorporate adjunct paper-based data collection methods. Second, the sample featured an overrepresentation of females, known to have more positive attitudes towards mental health help-seeking. Future research should aim for a more representative sample by including recruitment through male dominant sources. Third, the study featured a limited sample of participants with prior experience with computer-based therapies. While this sample naturally reflects the low uptake of these services, future research may actively recruit parents based on prior experience to further understand how experience moderates attitudes and access intentions. Fourth, the cross-sectional nature of this study was unable to illustrate temporal changes in parent attitudes and predictive factors and was unable to assess actual service uptake. Research using longitudinal methods to track attitudinal change and uptake behaviour is strongly recommended. Fifth, while the theory of planned behaviour (Ajzen, 1985), guided this study to examine the role of parental factors and attitudes in predicting access intentions, this theoretical framework was not directly examined. It is recommended that future research explore the fit of a theoretical model to parental uptake of computer-based therapies. Sixth, given the moderate sample size and the large number of predictors used in multiple analyses, the Type I error rate may have been inflated, thus future research is recommended to employ a larger sample size where possible. Finally, many of the measures used in the present study have not been psychometrically validated, relying solely on reliability estimates, modifications from previous research, and new measures developed by the authors. Future research is required to develop validated measures specific to consumer attitudes towards computer-based therapies.

5. Conclusions

The findings of this study make a contribution to our understanding of parental attitudes towards computer-based therapies for youth mental health problems. With evidence-based treatments now available to families through computer technology, we have the opportunity to significantly improve the mental health of Australian youth. This study showed that uptake is currently low and that parental knowledge of computer-based therapies is poor. Yet, in spite of this, parents appear to be positive about the use of these new services. We also know that parental intentions to access computer-based therapies for their children seem to be linked to prior experience, positive attitudes towards mental health in general, and service-specific knowledge. Our challenge now is to draw upon these factors to create active change in the uptake of computer-based therapies by Australian families.

Conflict of interest

The authors have no conflict of interest to report.

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