



Perspectives on ParentWorks: Learnings from the development and national roll-out of a self-directed online parenting intervention

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ABSTRACT

Online parenting interventions are an increasingly viable alternative to face-to-face programs, as they can potentially overcome barriers to participation and increase program reach. The current paper describes learnings from the design, development and dissemination of ParentWorks, a self-directed online parenting intervention designed to be inclusive of both mothers and fathers.

ParentWorks was promoted via a national media campaign and was accessible to all Australian parents through a dedicated website. Participants created a user account, engaged in a series of video modules, and completed assessment measures at pre-, post-program and 3-month follow-up. For two-caregiver families, parents were encouraged to participate together using a shared account. There was no direct practitioner support, although a range of innovative automated features were included to enhance participant motivation and encourage program completion.

Several key lessons emerged from program development and implementation. These relate primarily to design and content of the program website, user account functionality, program structure and features, and data collection. Further research is needed particularly with regard to methods for increasing participant retention in self-directed online programs.

The learnings described here will be relevant to those researching and developing online parenting interventions as well as other online mental health interventions aiming to reach a large population sample.

1. Introduction

Web-based technology has been harnessed in a range of interventions to promote child wellbeing (e.g., Baggett et al., 2010; Baker et al., 2017b; Enebrink et al., 2012; Sanders et al., 2012). Evidence-based parent training interventions, although traditionally delivered face-to-face in group or individual format, are particularly suited to online adaptation. These programs provide parenting information that can be conveyed via on-screen text or narration, and use practical examples and role plays to model effective parenting strategies, which can be easily adapted to video format and delivered via the internet (Breitenstein et al., 2014; Taylor et al., 2008). Survey and focus group research suggests that parents prefer online formats to face-to-face formats (Metzler et al., 2012; Tully et al., 2017a), and around half of parents already rely on the internet to access information and seek help about parenting and child behaviour (Baker et al., 2017a; Sweeney et al., 2015). Most importantly, there is evidence that online programs are effective; a meta-analytic review of online parenting interventions has shown they improve both parenting skills and child outcomes

(Nieuwboer et al., 2013). Given the accelerating trend towards web-based delivery of interventions for child and family mental health (e.g., see Jones, 2014), the intention of this paper is to share knowledge from the development and dissemination of an online parenting intervention, which may provide signposts for those intending to develop similar programs in future.

Online parenting interventions have several advantages compared to face-to-face treatment, particularly for increasing program reach. Disseminating interventions via the internet allows parents to participate at home and in their own time, which can overcome barriers to accessing services due to costs, limited time, and transport difficulties (Ritterband et al., 2009). Utilising technology to deliver interventions may be particularly important for reaching people in remote areas (Hall and Bierman, 2015; Kazdin, 2015). Further, the discretion and privacy afforded by online access may help overcome stigma around help-seeking (McGoron and Ondersma, 2015). Although research on web-based parenting programs is nascent, it has been suggested that online parent training interventions have the potential to increase engagement and retention of participants (Breitenstein et al., 2014), including those

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from vulnerable families (Jones et al., 2013).

Another key advantage of online interventions, beyond their potential to overcome practical barriers and stigma associated with help-seeking, is the capacity to be delivered with minimal or no direct practitioner involvement. Self-directed programs are lower cost, dependent on fewer trained staff and resources, and can reach a larger proportion of the population than therapist-assisted treatment (whether delivered online or face-to-face), making them ‘scalable’ or suitable for universal implementation as part of a public health approach (Andersson and Titov, 2014; Baumeister et al., 2014; Fairburn and Patel, 2017; Kazdin and Blase, 2011). If effective, such self-directed interventions can be delivered as part of a stepped care approach, with therapist assistance subsequently offered to parents who do not benefit from the self-directed program alone or whom require more assistance. When delivered in this way, a self-directed intervention could enhance the reach, efficacy and cost-effectiveness of parenting interventions. Self-directed online interventions need not be an impersonal experience, however; with existing technology they can be tailored to the user’s needs, by including features such as personalised participant feedback, individual goal-setting, and flexibility in choice of program content (Breitenstein et al., 2014; Fairburn and Patel, 2017; McGoron and Ondersma, 2015; Muñoz et al., 2016). There is evidence from a meta-analytic review that self-directed parenting interventions, in the form of bibliotherapy and internet-based interventions, are associated with improvements in parental perceptions of child behaviour, parenting and parental well-being (Tarver et al., 2014). Finally, there is also emerging evidence that self-directed online programs can be as effective as practitioner-guided programs, if they are engaging and include motivational tools such as automated reminders to complete the intervention, for example emails or text messages (Andersson and Titov, 2014).

Parenting interventions have primarily been developed and researched with the involvement of mothers (Fabiano, 2007; Panter-Brick et al., 2014; Tiano and McNeil, 2005), so it is important to facilitate the inclusion of fathers as well as mothers, particularly as there is evidence to suggest this can lead to improved parenting and child behaviour outcomes (Lundahl et al., 2008). Online programs are uniquely positioned to overcome barriers that prevent fathers from accessing face-to-face parenting services, especially in relation to cost of attendance, inconvenient location and lack of time (Frank et al., 2015; Tully et al., 2017a). As part of a research project to increase the engagement of fathers in parenting interventions in Australia, we developed a free, father-inclusive online parenting program called ParentWorks, which was launched nationally in August 2016. The evaluation of ParentWorks is described elsewhere (Piotrowska et al., under review) and results showed significant improvements from pre- to post-program in child emotional/behavioural problems, dysfunctional parenting, interparental conflict, and parental mental health problems, according to both mothers’ and fathers’ reports. The demographic, parent and child factors predicting dropout from the program have also been examined elsewhere (Dadds et al., 2018). Although developed and promoted to appeal to fathers, ParentWorks was designed to encourage participation of both caregivers where possible. While the program was adapted from an evidence-based intervention for managing child conduct problems (Dadds and Hawes, 2006), ParentWorks was intended as a universal intervention for parents of children with different levels of behavioural problems.

The aim of this article is to discuss learnings from the design, development and dissemination of a self-directed online parenting intervention. It is important to note that evidence-based parenting interventions do not automatically result in positive outcomes following adaptation for online dissemination (Nieuwboer et al., 2013), so careful consideration of program elements that may influence the effectiveness of the intervention is imperative. This program was one of the first parenting interventions to be delivered entirely online and included a number of novel elements, such as the capability to involve two

caregivers to enhance flexible user participation, and an explicit focus on father inclusion. The recommendations arising from these learnings will not only have implications for the development of future online interventions for parenting and child wellbeing, but may also be relevant to other online programs, especially those delivered as universal public health interventions.

2. The ParentWorks program

2.1. Website

2.1.1. Design, layout and content

A web development agency was contracted to design and build the ParentWorks website and the online program system, working in close collaboration with the research team. The website ‘look and feel’ was produced by a separate creative agency, which also developed the content for a national media campaign (‘The Father Effect’) that launched simultaneously with ParentWorks and aimed to promote the involvement of fathers in the program (see Tully et al., 2018). The website was designed to be ‘father-friendly’, while being careful not to exclude mothers or create the impression that the program was for fathers only.

The ParentWorks website consisted of several pages along with a program Sign up/Login section. Parents/caregivers who visited the Home page could read a brief program overview and watch an introductory video. The About page included a more detailed summary of program content, format and eligibility criteria. Other pages included a Contact Us form for participant enquiries, Media page with links to the media campaign videos, and a Resources & Help page including a list of services and online resources for parent/child mental health issues, parenting relationships, parenting advice/support, father-specific needs, as well as emergency contacts.

2.1.2. User testing

User testing was carried out on the website prior to program launch, with participants reviewing the public website pages and piloting the sign up and registration procedure. Feedback from user testing was incorporated to make changes to the website before the final version of the program was launched. This included editing of text content, as well as continual testing of the registration procedure to address any technical issues.

2.2. User account

2.2.1. Program registration

Participants registered for ParentWorks by first reading an online information statement and providing informed consent to participate, since the program was part of a research study. As a universal intervention, inclusion criteria were necessarily broad: participants were required to be a parent or caregiver of a child aged 2 to 16 years, currently living in Australia, aged 18 or over, and able to understand program content in English. After providing informed consent, participants created their own password-protected user account. They then completed a series of registration questions, including socio-demographic information about themselves and their family, along with ‘Getting to Know You’ questions, which included standardised measures of child behaviour, parenting, mental health, and interparental conflict (if they indicated they were in a relationship). During registration the first caregiver was asked if a second caregiver would be participating; if so, the second caregiver was invited to sign up within the same user account, by providing informed consent, creating their own login details, and answering the registration and Getting to Know You questions. The rationale for a shared user account for two-parent families was two-fold. Firstly, we expected that a single user account would encourage parents to participate in the program together. Secondly, a single user account facilitated data collection from two

parents, as it would have been difficult to link the data from two parents participating with separate user accounts. While the program encouraged both caregivers to participate, it was flexible in allowing caregivers to participate alone or together.

2.3. Program design and features

2.3.1. Program design

ParentWorks was adapted from an existing evidence-based parent training program for managing child conduct problems (Dadds and Hawes, 2006), which is delivered as a face-to-face intervention over a number of weekly sessions with a psychologist. ParentWorks is based on social learning theory, the theory underpinning most previous online parenting interventions (see Nieuwboer et al., 2013). A previous web-based version of this program has been found to be effective in reducing child externalising problems (Kirkman et al., 2016). In keeping with the pacing of the face-to-face program, ParentWorks was designed as a series of individual video ‘modules’, each around 20 to 30 min in duration, to be completed once a week. Participants completed the Getting to Know You questionnaires at three assessment time points (program registration, program completion and 3-month follow-up), and additional questions were administered during each module. After completing the post-program assessment, participants could download a ParentWorks completion certificate. As described below, ParentWorks also included several innovative features designed to enhance participant engagement and allow flexible participation in the program.

2.3.2. Program modules

There were eight program modules (five compulsory or ‘core’ modules, and three optional modules), accessible via the user account dashboard (‘My Modules and Workbook’; see Fig. 1). Optional modules

included Working as a Team (module 5) and two additional modules parents could complete after post-program questionnaires: Encouraging Child Development through Quality Time and Play (module 7) and Bully-Proofing Your Child (module 8). Thus, participating parents watched either five or six modules prior to completion of post-intervention questionnaires. The inclusion of optional modules allowed for user flexibility and program tailoring to suit parents with different needs. For a description of participant flow through the program and module content, see Tully et al. (2017b). Aside from modules 1 and 2, which could be completed immediately after program registration, modules were accessed in sequence one week apart. Each module consisted of video segments in which a male clinical psychologist delivered the intervention content on screen or via voiceover narration, and key program principles and skills were demonstrated using footage of parents (fathers and/or mothers) enacting the program strategies with children.

2.3.3. Program features

It was important to allow parents to interact with the program in their own time and at their own pace, therefore flexibility was provided in regard to viewing the program modules. Participants in a shared account could view any module either together or individually.

There were also several program features that were designed to mimic the features of a face-to-face parenting intervention, and promote parental self-regulation and self-monitoring. First, there were interactive ‘in-session’ exercises during the modules, which allowed participants to reflect on their own parenting and apply the program content to real-world situations in their family life. Participants typed their responses to the exercises on screen, and responses were compiled in a workbook along with written summaries of module content, which could be downloaded and printed after each module. Parents were

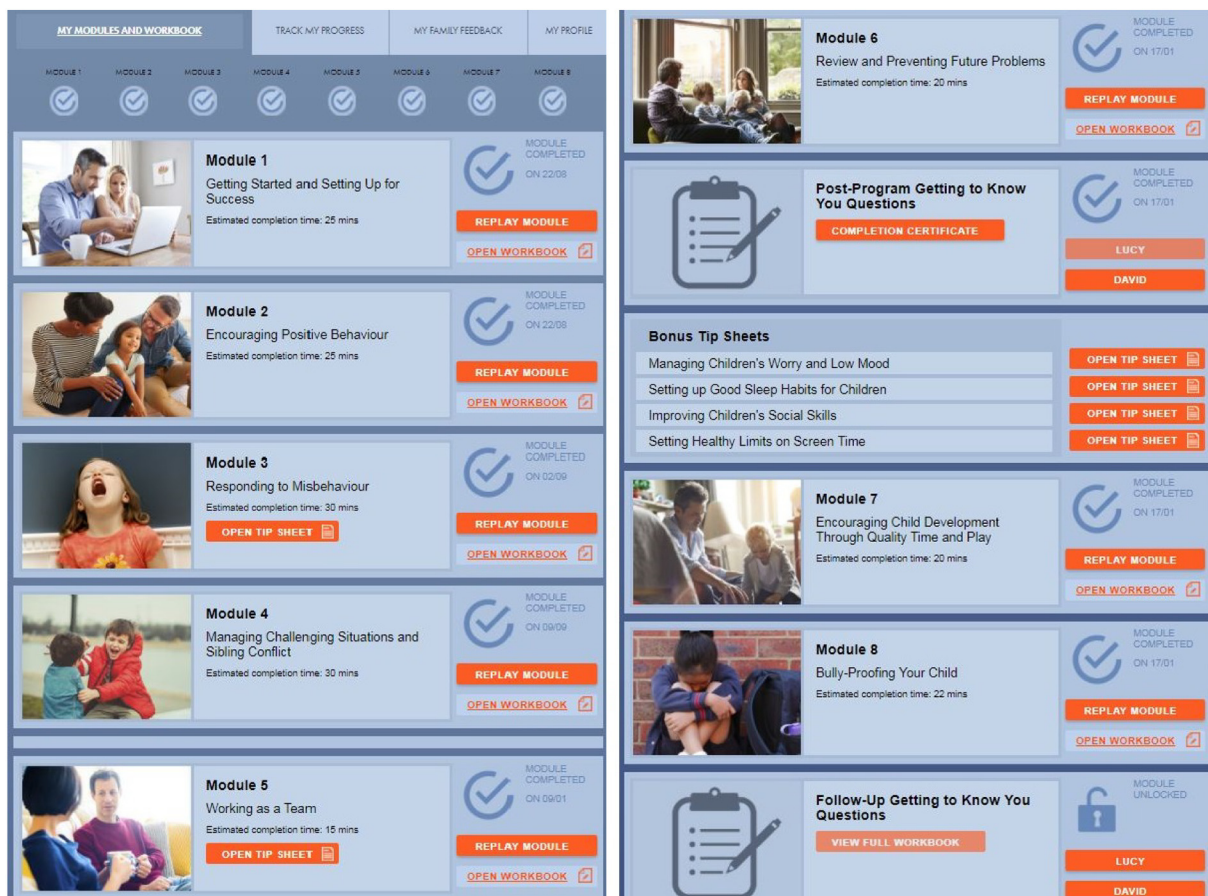


Fig. 1. Screenshots of ParentWorks user account dashboard (‘My Modules and Workbook’).

encouraged to set goals after each session, implement positive parenting strategies between sessions, review their implementation of strategies, problem-solve difficulties that arise, and set goals for change. Some modules included an additional tip sheet which addressed issues relevant to certain families, for example discipline strategies for older children and teens. Between modules, participants were prompted to engage in homework exercises for practicing the skills learned in the previous week's module.

Second, at the beginning of each module, participants rated their own parenting confidence and their child's behaviour (on a scale of 1 to 10) over the past week. These scores were displayed on two 'Track My Progress' graphs that allowed parents to visualise their family's progress throughout the program. These measures were designed to increase parental self-reflection and mimic reviews of progress that are integral to face-to-face treatment.

Third, in order to customise the user experience of ParentWorks, automated feedback was provided within the family's user account ('My Family Feedback'), based on participant responses to the Getting to Know You questionnaires at registration, post-program and 3-month follow-up. If a participant scored in the high range on standardised measures of child behaviour, interparental conflict and/or parent mental health at any of the three time points, a message within the My Family Feedback section advised them to seek further assistance via relevant resources listed on the Resources & Help page. Participants in two-parent families were also recommended to complete the optional Module 5 ('Working as a Team') if their scores at registration indicated there was significant disagreement about parenting. Receiving feedback at registration, post-program and 3-month follow-up was designed to mimic the feedback received from a therapist in face-to-face treatment.

Finally, all participants consented to receiving email reminders as a condition of program participation. These emails were used primarily as prompts to complete the next module, and in cases where program questionnaires were incomplete, participants were inactive for more than three weeks, or the program was put on hold for more than four weeks.

2.3.4. On hold and discontinue functions

Participants were able to put the program on hold, for example if they were going away for a period of time. If they wished to discontinue the program, they could do so by changing the settings within their account and answering an exit question about why they were discontinuing.

2.4. Data collection

2.4.1. Assessment measures

For a detailed description of the assessment measures used, see Tully et al. (2017b). The primary outcome measures of child behaviour, parenting, interparental conflict and parent mental health were administered via the Getting to Know You questionnaires at registration, post-program and 3-month follow-up.

2.4.2. Measurement of program engagement

During the program, caregiver engagement was measured in a range of ways. As some modules were optional, and all modules could be viewed more than once, the online system automatically recorded data on the number of times each module was accessed. For two-caregiver accounts, every time a module was accessed, participants manually indicated who was watching by ticking a box next to the relevant caregiver name/s at the start of the module (this was not necessary for single caregiver accounts). To measure homework completion, for modules 3 to 6 each caregiver rated how often they used the strategies from the previous module. They also rated their impression of the content of each module, which provided a measure of satisfaction with program content.

3. Learnings

3.1. Website

3.1.1. Design, layout and content

During website development and user testing it became evident that the text on the public website pages was critical for initial engagement of participants. It was important to provide enough information so that parents/caregivers could make an informed decision about whether the program was suitable for them, while avoiding excessive written content. User testing and continual revision of website content was essential for streamlining text, ensuring it was both clear and relatively concise.

Although ParentWorks was entirely self-directed, the website's Contact Us form enabled participants to have direct communication with the research team in case of enquiries or technical issues. The Contact Us form was utilised frequently in the period immediately after program launch, when the majority of website technical issues and user queries arose. At this stage it became clear that we could circumvent many enquiries by providing information about compatible devices, operating systems and browsers, and this information was added to the Sign Up/Login section shortly after program launch. In retrospect, it would have been advisable to include a 'Frequently Asked Questions' page on the website; however, it was difficult to predict the common questions before the program went live. Future programs could derive this information from more extensive initial user testing.

3.1.2. Target audience

The program name, ParentWorks, was selected as it was inclusive of both fathers and mothers. Even so, many parents were uncertain of the target audience; user testing indicated that some mothers thought the program was intended for fathers only, due to the 'father-friendly' website content (both explicit and implicit), and the father-focused media campaign ('The Father Effect'). While this may have risked discouraging mothers to participate, given the lack of available father-inclusive parenting programs, it was essential to overtly target father involvement. Indeed, around 40% of participants were fathers (see Dadds et al., 2018, for further information), which compares favourably with rates of participation in other online parenting programs that have reported father involvement (e.g. Dittman et al., 2014; Enebrink et al., 2012). At the same time it appears that mothers were not deterred, as they still constituted the majority of participants.

Program researchers were contacted by many caregivers who were seeking to complete the program but whose child was not currently in their care. Although having a child in their care was required to put the program strategies into practice, this was not explicitly stated as an inclusion criterion for research/program participation, so these families were eligible to participate. However, as they are unlikely to have been able to practice the program strategies with their children, their participation may have limited the research findings in relation to child behaviour outcomes. Developers of future online parenting programs, particularly those that include a research component, should consider whether or not programs are suitable for families without children in their care, and include a statement about this on the program website.

3.1.3. Device compatibility

As highlighted in reviews of online interventions for parenting (e.g., Hall and Bierman, 2015) and mental health (e.g., Andersson and Titov, 2014), online programs are more likely to be accessed by people with a high level of education, due to the 'digital divide' whereby internet use is more common amongst individuals with higher socioeconomic status (SES). However, a recent Australian survey found that level of SES did not influence parents' access to online parenting information (Baker et al., 2017a). In addition, smartphone compatibility has been shown to be particularly important for reaching low-income groups, who are less likely to access the internet via desktop computer, but highly likely to

own a mobile phone (e.g. Hall and Bierman, 2015; Jones et al., 2013). Despite this, a systematic review of online parenting interventions found that none of the programs reviewed were formatted to enable mobile viewing (Breitenstein et al., 2014). ParentWorks was formatted for viewing on mobile and tablet devices as well as desktop/laptop monitors. Encouragingly, the website analytics indicated that 44% of user sessions during the program's first 12 months were from mobile phones and 13% from tablet devices, versus 43% from desktop devices. Including smartphone compatibility as a technical requirement of online programs may be an important step towards increasing the reach of online interventions and overcoming barriers to access for low SES families.

3.2. User account/registration

3.2.1. Flexible participation

A key feature of ParentWorks was the capacity for two caregivers to participate in the program together and each contribute individual participant data. To our knowledge, all other online parenting interventions evaluated to date have allowed for participation of one parent only. From our perspective, however, including both caregivers where possible is an integral component of the face-to-face intervention from which ParentWorks was adapted (see Dadds and Hawes, 2006); it is likely to enhance interparental consistency, contribute to more effective implementation of program strategies, and may potentially enhance outcomes for parents and children (Lundahl et al., 2008). It was also imperative to track and record mother and father data separately, as there is some evidence that parenting programs, while effective for fathers, may not be as effective for improving fathers' parenting relative to mothers (Fletcher et al., 2011).

While we aimed to make participation flexible and user-friendly, it was necessary to work within the technical constraints of the website and also balance the complexities of data collection. A second caregiver could only be added to the user account during registration, and not after commencing the program. Similarly, neither caregiver (in a two-caregiver account) could be removed from an account after registration was complete.

Despite our efforts to provide a flexible user experience, the proportion of parents who elected to participate together using a shared account was less than expected, with just fewer than half (48%) of married or de facto participants who completed the program choosing to participate with a second caregiver (for further information, see Dadds et al., 2018). We also received many enquiries from caregivers who wished to participate in the program together but had created separate individual accounts, usually because they registered at different times and expected that their accounts could later be linked. Thus, it appears that lack of flexibility in the account registration process may have constrained the numbers of shared caregiver accounts. Flexible user participation should be a key consideration of future online programs involving multiple participants/informants, provided this is not achieved at the cost of adequate data collection.

3.2.2. On hold and discontinue functions

These options were intended to facilitate flexible participation, and to provide the researchers with data to help account for program dropout and non-completion. However, these program functions were rarely used by participants. A better solution may have been to automatically close the user account if the participant/s did not access the program for a certain period of time (e.g., two months), and to also administer the post-program questionnaire at this point, regardless of number of modules completed.

3.2.3. Need for separate practitioner login

There was considerable interest in ParentWorks from practitioners, including social workers, psychologists and school counsellors, who hoped to view the program before recommending it to caregivers.

During website development we considered providing a separate program login for practitioners, but due to technical difficulties, we did not proceed with this option. While some practitioners may have been eligible to participate if they had a child of their own, it is possible that some ineligible practitioners enrolled in ParentWorks to view the program, potentially confounding our results. It is highly recommended that online programs include an option for practitioners to access program content or detailed information explaining the program content.

3.3. Program design and features

3.3.1. Program design

Based our experience, it would have been best to involve a web agency from the earliest stages of program development, to assist in translating the face-to-face intervention into a user-friendly online program. However, due to internal institution procedures, we were required to design the program architecture prior to involvement of the web agency, and this led to some issues with the eventual program structure and function. For example, we envisaged each module as a single video with interactive activities and questions throughout, whereas the website system required the modules to consist of several video segments interspersed with static screens for displaying participant questions and in-session exercises. This required the user to press a 'continue' button after each module section, which was not always an intuitive step for participants, resulting in many user queries regarding module completion. If we had been able to engage the web agency earlier in the design process this may have allowed us to develop a more user-friendly module design.

3.3.2. Features designed to mimic face-to-face programs

There were a number of features of ParentWorks that were designed to mimic the features of face-to-face programs (see Section 2.3.3) and were included to improve participant adherence, engagement and program effectiveness. However, it is not possible to know whether their inclusion had the desired effects since we did not implement a control version of the program without these features. In relation to tracking child behaviour and parent confidence, Whitton et al. (2015) previously used a symptom tracking feature in an e-health intervention for adult depression, anxiety and stress, and found that this feature was associated with improved treatment outcomes, although we are not aware of this approach being used in other online parenting programs. While displaying parenting confidence and child behaviour ratings visually over the course of the program was intended to motivate parents and provide feedback, it is also possible that these graphical representations could demotivate parents if they saw no change or an increase in problem behaviour and/or parenting difficulties over time. Future research should examine whether regular feedback to participants during self-directed programs impacts completion rates and/or program outcomes.

In relation to automated feedback, this was provided at the family level. That is, where two caregivers participated via a shared account, combined feedback was given based on the highest severity scores on individual participant questionnaires. As each parent/caregiver's questionnaire responses may have differed, this meant the feedback had to be worded in a general way. For example, 'At least one caregiver has indicated that [child's name] is showing behavioural and/or emotional problems at a moderate level.' For reasons of confidentiality, it may be important for some online programs to provide feedback to individual participants even if they have a shared program account. Once again, we have no information about whether this feature increased engagement or adherence.

In relation to email reminders, these were designed to provide participant prompts in the absence of practitioner involvement. Although practitioner support has been linked to better program outcomes and adherence, it is not clear how much support is optimal, and

automated reminders are an ideal solution for online programs that employ a universal intervention approach (Andersson and Titov, 2014). Text message reminders were considered instead of emails, and may have been a more effective form of prompting as they cannot easily be blocked. However, this would have involved obtaining phone numbers for participants, which was deemed too intrusive. Future research should assess whether participant reminders impact program outcomes and adherence, and test different frequency schedules and delivery methods of automated prompting. It may also be important to allow participants to choose if and when they receive prompts.

3.3.2.1. Module unlocking procedure and program pacing. ParentWorks was structured so that only one module could be completed per week, to allow time for participants to practice program strategies between modules and to mimic the pacing of a weekly face-to-face program. The pacing of online parenting programs appears critical for maintaining participant interest and motivation, although it is not clear from previous studies how pacing affects program effectiveness or completion rates (Breitenstein et al., 2014). The first two ParentWorks modules were unlocked immediately after registration, so that participants could begin straight away. This was intended to capitalise on interest in the program and maximise retention of participants. Module 1 included content designed to increase the likelihood of program completion, such as explaining the program purpose, with an emphasis on the critical importance of involving fathers. Goal setting and motivational interviewing were employed to encourage families to focus on what they hoped to achieve from the program and consider potential barriers to program completion, as well as ways to overcome these barriers, since there is evidence from face-to-face parenting interventions that motivational interviewing can enhance participant motivation and commitment to program completion (McGoron and Ondersma, 2015; Nock and Kazdin, 2005). However, this meant that participants did not immediately receive information about parenting strategies, which began in Module 2. Thus, it may have been advisable to include a briefer opening module or alternatively, Modules 1 and 2 might have been combined in a single module, so that the introductory content could be delivered along with more practically-oriented material. In any case, research is needed regarding the pacing of online interventions, including ways to maximise participant motivation and program retention in the absence of direct practitioner support.

3.4. Data collection

3.4.1. Program dropout and completion of assessment questionnaires

Despite the fact that the core program could be completed in as little as 3 to 4 weeks, and each module was only 20 to 30 min in length, there was an unexpectedly high dropout rate. We administered the post-program questionnaire after the final compulsory module (module 6: 'Review and Preventing Future Problems') to replicate the face-to-face treatment experience and ensure the core components of the intervention were delivered before assessing outcomes. However, in practice, due to the high number of dropouts, only 7% (217/2967) of participants who registered went on to complete the post-program questionnaire, with a steady and consistent rate of dropout across the modules (see Dadds et al., 2018, for further information about dropout and predictors of dropout). We included additional modules and tip sheets that could only be accessed after completing the post-program questionnaire, although it appears that these incentives were not particularly effective for reducing attrition. There are two alternatives that may have resulted in a higher rate of post-program questionnaire completion. Firstly, caregivers could have selected when they were ready to exit the program and received the questionnaire at this point, regardless of how many modules they had completed. Secondly, we could have administered the post-program questionnaire after a fixed period of time, for example two months after registration (regardless of

number of modules completed), as other online programs have done (e.g. Baker et al., 2017b; Sanders et al., 2012).

It is uncertain whether high rates of dropout are to be expected in self-directed online parenting programs, since most studies of online parenting interventions have included some degree of practitioner support. Based on the available evidence, however, programs without practitioner support tend to have high dropout rates (e.g., Hall and Bierman, 2015). Consequently, future research should investigate strategies for enhancing commitment and motivation to complete self-directed online parenting programs, or, at the very least, for maximising post-program data collection. As this parenting intervention specifically targeted the involvement of fathers, it is important to note that levels of father participation in ParentWorks were high (40%), and dropout rates did not differ for fathers versus mothers (see Dadds et al., 2018), suggesting the program design was successful in engaging and retaining fathers.

3.4.2. Measurement of program engagement

Collecting participant data on module viewing (for two-caregiver accounts) was a novel solution for measuring program engagement and can be used as a proxy measure for level of participant engagement in online programs (Breitenstein et al., 2014), and may be particularly useful for programs involving multiple participants within a shared account.

While the mix of compulsory and optional modules allowed for user flexibility and tailoring of the program to families with different needs, this created additional complexity in terms of data collection. For example, as the optional Module 5 was available to complete before administration of the post-program questionnaire, there were different treatment dosages (either 5 or 6 modules). In addition, participants could choose to complete up to three optional modules (including Module 5, if they had not yet completed it) after the post-program questionnaire, resulting in a range of different potential program experiences by the time the 3-month follow-up questionnaire was administered. Future research should consider the use of optional modules carefully, in light of the arising complexities in data analyses.

4. Implications for development of future online programs

The learnings discussed herein have implications for the development of a range of online parenting programs as well as other online interventions. This information is likely to be relevant for online adaptation of interventions for any child mental or physical health problems where parental participation is important. It may also be relevant for interventions which do not focus on child outcomes. For example, a key component of ParentWorks was the capacity to involve two caregivers where possible, via a shared account that allowed for flexible user participation, and this approach may be appropriate for other online programs involving couples, such as online self-directed interventions for managing relationship issues. In addition, the program was structured similarly to most internet-based cognitive behavioural therapy programs, which employ features such as a secure user account, online treatment modules, homework assignments and questionnaires (Andersson and Titov, 2014). On the basis of our experiences in developing and disseminating ParentWorks, we have provided a series of general recommendations to aid the development of future online interventions:

- If working with a web development partner, involve their expertise from the earliest stages of program design in order to optimise website design and functionality.
- Online programs should also be formatted for viewing on mobile devices, as this may be critical to reaching participants from all socioeconomic backgrounds.
- If it appears likely that practitioners will refer clients to the program, provide a separate login or summary of intervention content

specifically for practitioner use.

- Provide explicit instructions within the program to orient participants to system processes and ensure their progress is not hindered by technical constraints.
- Carefully consider the length of assessment tools so as not to deter families from registering for the intervention.
- Carefully consider when and how to administer post-intervention assessment questionnaires in order to maximise data collection.

Given more interventions will be delivered online in future, there is also a need for further research, particularly regarding strategies for enhancing participant motivation and completion rates in self-directed online programs. Such research might explore program pacing and its relationship to program completion; the impact of user flexibility and tailoring of programs, for example allowing participant choice in selection or order of program content; and comparison of program delivery both with and without participant feedback and/or automated reminders.

5. Conclusions

To our knowledge, this paper is the first to describe considerations and learnings from the development and real-world implementation of a self-directed online parenting intervention. This article will therefore be of use to researchers and clinicians intending to create similar programs in future. As the program was entirely self-directed and designed for universal uptake, this article may have broad relevance to other online mental health interventions aiming to reach a large population sample.

Conflict of interest

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