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Reducing Attrition in Online Interventions for Parents and Families

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Summary

- There are well-established predictors of attrition in traditional face-to-face family-based interventions (e.g. SES, levels of psychological distress, unhealthy lifestyle factors)
- However, we know little about the predictors of attrition in a interventions that are delivered online

Attrition in Face-to-Face Parenting Interventions

- The Barriers to Treatment Model (BTM) underscores the influence of participant perceptions and expectations on attrition. Originally created as a therapeutic model, it illustrates the importance of **communicating clearly** with participants from the outset, and subsequently **setting up realistic and achievable goals** throughout the intervention
- Providing **therapeutic support is clearly protective against attrition:** Consistent and accessible support throughout an intervention can prevent certain predictors of attrition (e.g. maternal distress) from having an impact
- It is not known whether therapeutic support offered via an online platform might have a similar impact on attrition.

Attrition in Online Mental Health Interventions

- Online interventions have the potential to remove many barriers to participation that face parents and families (e.g. removing need for travel and childcare, giving flexibility of timing).
- There is evidence that giving the online intervention a **flexible and explorative mode of delivery**, which is accessible platform to a wide range of abilities, attrition can be reduced.
- Allowing users to **personalise their online experience,** and by designing the platform to give a sense of control to the participant (e.g. by allowing choice over the order in which material is accessed), engaged is increased.

Attrition in Online Parenting Interventions

- Online interventions may be a useful way of engaging fathers and other groups of parents who can be difficult to reach (e.g. single parents, and those in conflicted relationships). However, little is known about predictors of attrition in this setting.
- However, there are certain design features (layout, length of intervention, and degree of control over the learning path) that appear likely to impact engagement.
- Though not always practical, providing some form of **support** for those taking part is likely to be helpful to reducing attrition - this could be therapeutic support and/or peer support.
- **Parental perceptions** of the efficacy of treatment, and their ability to commit to such an intervention, are also key predictors of attrition

Key conclusions

1. Providing peer, or therapeutic support throughout the intervention can combat the distance that comes with offering an intervention online, and is likely to improve attrition rates
2. Participant perceptions and expectations of the intervention are key predictors of attrition. It is vital that researchers find ways to manage participant expectations as well as helping them create realistic and achievable goals.
3. A sense of control, and the ability to personalise one's own experience within the context of an online parenting intervention, is central to reducing rates of attrition.

Introduction

Research into interventions aimed at parents, particularly interventions delivered online, have burgeoned in recent years. Yet, one of the biggest challenges remains – participant attrition. Attrition is defined as "premature termination decided unilaterally by the patient, against therapist advice" (Fernandez & Eyberg, 2009). Attrition can have damaging effects, both for the participant, and for the research. As a researcher, abnormal levels of attrition can have a significant impact on the external validity and generalisability of a study, ultimately impacting the reliability of its findings (Harris., 1998). It can alter the composition and characteristics of the sample, invalidating any generalisations based on the original group of participants. At extreme levels, it can significantly reduce the sample size of a study, impacting the statistical power of its findings (Howard, Krause, & Orlinsky., 1986). The evidence suggests that the success of an intervention is a function of five multiplicative factors: Reach, Efficacy, Adoption, Implementation and Maintenance (RE-AIM framework: Glasgow et al, 1999). Therefore, no matter what the reach, if the intervention is not successfully adopted, implemented and maintained, it is arguably ineffective. Attrition can influence this.

A study by Harris (1998) indicated that, between 1990 and 1995 alone, there were over 150 journal articles exploring attrition. Methodology has gradually emerged, detailing ways in which attrition can be prevented. For example, in a study by Gustavson, von Soest, Karevold, and Røysamb (2012) some of the key predecessors of attrition were demonstrated – these included sociodemographic variables (e.g. low educational level), unhealthy lifestyle factors (e.g. high alcohol consumption) and high levels of psychological distress.

Attrition rates in randomised controlled trials involving parents are higher than for many other types of trial (Morawska, & Sanders, 2006). In face-to-face parenting interventions, challenges such as lack of childcare and child ill health are more likely for this group of participants than for others (Fernandez, & Eyberg, 2009). Although studies have examined the causes of these high levels of attrition within this participant group (e.g. Chacko et al. 2016), the rate has remained stubbornly high. This has led the field to explore online interventions as an alternative way of retaining this difficult to engage group.

However, with new therapeutic technology, comes new challenges. One of these is the emerging concern that well-established predictors of attrition in face-to face interventions can no longer be relied upon in the context of online learning. Research has cautioned against the "uniformity assumption" (Fernandez & Eyberg, 2009) - the idea that predictors of attrition are similar, or uniform, across contexts. Fernandez and Eyberg (2009) argue that predictors of attrition in one intervention or treatment program may not be applicable to others. Variables such as age, diagnosis, intervention type or treatment modality (i.e. digital or face-to-face) might be associated with different patterns and predictors of attrition. Although general research into attrition is extensive, our understanding of the challenges posed by online interventions is limited (Dadds et al, 2019).

The findings pertaining to both online and face-to-face parent-based interventions are summarised below.

Reducing attrition in face-to-face parenting interventions

Early evidence suggested that factors such as socio-economic status (SES) (Armbruster, & Fallon, 1994), lack of spousal involvement (Spoth et al, 1996) and childcare problems (Snow, Frey, & Kern, 2002) were significant predictors of attrition in this service user group. However, when these factors

were addressed directly, there did not appear to be any significant improvement in attrition rates. In a study by Baker, Arnold, and Meagher, (2011), dropout rates of between forty and sixty percent persisted, even when financial incentives, childcare, refreshment, and transportation were provided. This study did, however, posit that logistical difficulties impacting attendance (e.g. lack of time, family commitments) may be linked to SES, which could explain the small but significant relationship that has been observed between income and dropout rates. Unfortunately, it is not possible for researchers to change the SES of their participants. Therefore, we must find other ways to improve attrition rates and maintain service user involvement in parenting interventions, across all demographic categories.

One way in which this has been proposed, is through using evidence gathered from the "barriers to treatment model" (BTM). This conceptual model aims to address any barriers and obstacles that make a contribution to attrition rates, beyond the more well studied demographic characteristics (Kazdin, Holland & Crowley, 1997). Aside from practical barriers and obstacles, the BTM suggests that perceived barriers (perceptions of treatment relevance, poor therapeutic relationship, perceived stressors) are significantly related to attrition. In a study by Nock, and Kazdin (2001), the significance of the BTM in predicting attrition in parenting interventions, was investigated. Overall, this study concluded that parental expectancies of the intervention, and perceptions of its relevance, were a significant predictor of treatment participation, even after controlling for demographic characteristics. Parents who did not expect the intervention to be effective experienced significantly greater barriers to participation. Similarly, a study by Kazdin, Holland and Crowley (1997), which also investigated the BTM, demonstrated that barriers to participation in treatment, such as perceived stressors and obstacles, and perceptions that treatment was not very relevant, were significantly associated with premature termination. They found that as the level of perceived barriers to participation increased among parents and families so did attrition.

Based on these findings, researchers should make a concerted effort to clearly communicate to participants how the intervention could benefit them. Setting up achievable and gratifying expectations, and communicating these at the outset, may be enough to engage with and retain those parents who hold negative expectations. This idea was supported in a study by Morawska and Sanders (2006), which illustrates the importance of educating parents on the process of the intervention, and the ways in which the intervention will benefit them. Through an analysis of previous studies, Morawska and Sanders (2006) demonstrated that an increase in engagement is achievable through the use of preparatory videos which introduce participants to the intervention before it begins. By clearly illustrating the process and goals of the intervention, researchers were able to control participants' expectations, allowing them to create realistic goals, and achievable outcomes. The development of preparatory videos also acted as a form of guidance and support from the therapist or team, ultimately aiding the establishment of a positive and supportive therapeutic relationship. This is a key protective factor against attrition, as demonstrated in the BTM (Kazdin, Holland & Crowley, 1997)

While there is no doubt the BTM holds promise for reducing attrition generally, much of the research has had a therapeutic focus, and explores treatment drop out, rather than drop out from trials. Though many of the findings may still be applicable, it may be wise to explore attrition more specifically in research settings.

Kane, Wood and Barlow (2007) carried out a systematic review of parenting programmes and randomised controlled trials in order to identify some of the key aspects that make parenting interventions meaningful and helpful to parents. They highlighted a number of key factors that should be considered when attempting to engage parents in interventions, (Figure 1). For example, creating tangible opportunities to acquire new knowledge and skills throughout your intervention, and promising this during recruitment, could make a significant difference to attrition rates. However, this is based purely on qualitative literature analysis, and so there is limited evidence for its utility in practice.

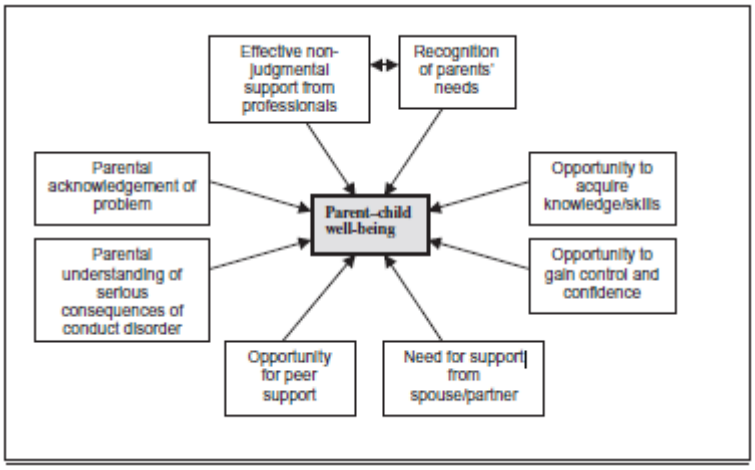

Figure 1 -A diagram showing some of the key factors that influence parental engagement in interventions. Taken from: Kane, G. A., Wood, V. A., & Barlow, J. (2007). Parenting programmes: a systematic review and synthesis of qualitative research. *Child: care, health and development, 33*(6), 784-793.

In a study by Fernandez and Eyberg (2009), maternal distress was shown to be a clear predictor of attrition, both within the intervention, and during follow-up. However, this was only true in certain circumstances, and could be prevented. For example, in parents who had access to assistance (i.e. monthly telephone calls with a therapist who offered support where needed) both during and after the original intervention, maternal distress remained unrelated to attrition. However, if all therapist contact was removed immediately after the intervention, or was never present at all, maternal distress arose as a clear predictor of attrition. As a result, the study concluded that clinicians and researchers alike should aim to provide a space where parents involved can access support and advice, should they need to. Obviously, this may be impractical. More research is needed to determine whether the support offered must come from a particular person, or be delivered in a certain context, or whether it can be offered through peers or other avenues, and platforms.

Another factor that has been shown to influence attrition rates in parenting interventions is the intensity and duration of the intervention itself. In a systematic review by Tully and Hunt (2016), the efficacy of brief parenting interventions (<8 sessions), was explored. It was found that, in comparison to those who participated in longer more extensive interventions, parents who completed the brief intervention engaged more effectively and experienced better outcomes overall. The findings in this study are supported by Morawska and Sanders (2006), who suggest that one of the key barriers to participation is related to the timing and length of sessions. They also suggest that practical issues such as timing and length of sessions could be addressed by offering parenting interventions through other modalities, such as through the mainstream media, or online.

Reducing attrition in online interventions

Online interventions are relatively new and present their own challenges when it comes to service user adherence. Attrition rates are generally higher in online learning than in traditional settings, especially in large scale online learning environments. (Kizilcec, & Halawa, 2015). However, as demonstrated in a survey of parents by Sanders (2010), which examined the ways in which we can adopt a public

health approach to parenting interventions, one of the most preferred modes of accessing an intervention was through the internet. In a study by Dittman et al (2014), none of the typical adversity factors known to influence attrition in face-to-face parenting interventions (e.g. low parental education, low family income), had the same impact on an online version of the intervention. This provides support to the idea that well-established risk factors are no longer of importance when predicting parental outcomes in online parenting interventions. Though more research is needed, the power of online interventions to improve reach is clear.

In a study of attrition in an international internet smoking cessation intervention, delivered to 16,000 participants, in over 150 countries worldwide, Geraghty et al (2013) found a number of factors that were associated with attrition rates. In particular, participants who exhibited behaviours that were indicative of a more severe problem (e.g. reduced confidence in their ability to quit smoking, longer chosen delays before quit days) had much higher rates of attrition. The authors suggested modifying online interventions to include modules aimed at increasing confidence in participants. Another key finding from this study was the influence of education on attrition. Participants who had a lower level of education were more likely to drop-out of the online intervention. This parallels findings from a study by Armbruster and Fallon (1994) which demonstrated that participants with a lower SES, as identified by education and job title, were much more likely to drop-out.

However, unlike in traditional face-to face interventions, there are ways in which online programmes can be designed to reduce the influence of this otherwise hard-to-control demographic characteristic. Based on patterns of attrition observed in their own study, Geraghty et al (2013) suggest that personalisation of the online intervention (e.g. by selecting a preferred format, such as video or audio instead of text) the impact of education on attrition could be reduced. However, until more research is carried out, this cannot be proven.

Whilst the findings of Geraghty et al (2013) have a lot to offer our understanding of attrition within large scale online interventions, it is important to note the international nature of this study. To extend the reach of their intervention, researchers offered it in two languages, Spanish and English. Offering an intervention internationally risks increasing the variance of predictors of attrition, making them more difficult to pinpoint. However, in this case, there was no difference in attrition rates across these two languages, suggesting perhaps, that certain predictors of attrition may be universal.

Yet, it may be inappropriate to generalise the findings from an online intervention for smoking cessation, to online interventions for mental health. In addition, many of the findings relating to attrition are specifically focused on loss-to-follow-up, rather than attrition from the intervention itself. Therefore, our attention now turns to attrition within online mental health interventions.

Reducing attrition in online mental health interventions

In a study by Doherty, Coyle, and Sharry (2012) attrition and engagement in ‘SilverCloud’, a widely-used online mental health intervention, was examined. This intervention is offered to those with mild-moderate anxiety or depression. The authors found one feature that was common to all service users who engaged well with the online SilverCloud programme - a preference for a more flexible and explorative mode of delivery. The authors suggest that, unless there is a strong reason not to, it may be wise to give a degree of control to the user. For example, by allowing users to choose their own pathway through an online intervention, it can create a sense of ownership and control which is central to decreasing attrition. Another way of personalising the intervention is by allowing users to have a "homepage" or "dashboard" which is all about them and where they are up to in the

programme. In the SilverCloud intervention, this was a space in which users could write some information about themselves, keep a journal of their thoughts throughout the programme, as well as controlling which applications (e.g. calendar, badges, to do lists) appear on their homepage.

It has long been shown that interventions are most successful if they take advantage of a user's existing strengths and resources, and if the treatment is tailored to meet their interests (Doherty, Coyle, & Sharry, 2012). This is made especially clear through a comparison between a less personalised online CBT-based programme, and the more user-driven and tailored experience, SilverCloud offers. Both interventions took place within the same population of participants. Researchers observed a significant difference in drop-out rates, with drop-out referring to the number of participants not engaged at session eight. In the less interactive CBT based programme, a drop-out rate of 74% was observed, compared to the much smaller rate of 36% in the SilverCloud intervention.

Another factor that was found to be important was establishing a sense of connection with the therapist, or 'supporter'. It is well-known that one of the most important factors that keep service users involved with face-to-face interventions is the chance to feel supported and have an opportunity to collaborate with others, and no longer feel alone (Kane, Wood & Barlow, 2007; Fernandez & Eyberg, 2009). However, this can easily be lost in an online setting. Moreover, many argue that this is an extra risk for vulnerable service users completing an online intervention, particularly if any of the content is potentially traumatic or triggering (van't Hof, Cuijpers, & Stein, 2009).

However, there are a number of ways in which a researcher can create an environment of support and connectedness online (Doherty, Coyle, & Sharry, 2012). Many of the comments from service users who took part in their online intervention demonstrated that even just knowing that someone is there, is significant. For example, one service user said they found it comforting to know that someone was taking an interest in their progress, and that there was someone there who could answer any questions they had. Another service user said that even without meeting the person, or speaking to them, the supportive comments that were given every week, were extremely encouraging. Though the support offered in this intervention was from a real person, the comments suggest that automated feedback may be sufficient. The therapeutic support offered was largely via the online platform itself, so would provide the user with the same experience as automated feedback, in a practical sense. Though automated feedback could allow online interventions to reach a wider range of service users without requiring an extensive team, it is still unknown whether automated feedback can offer the same level of personalised encouragement that a real person can.

Another study by Song and Bonk (2016), also reported that freedom of choice, and sense of control, were key to engaging learners in a self-directed, online learning environment. Clearly, the extent to which this can be achieved will always be limited, but by creating even an illusion of control, users seemed to engage more with the content of the intervention and participate for longer. For example, by allowing service users to personalise their online experience by choosing their own path through the materials, it allows them to create their own identity within the remit of the intervention. As stated in this article, intrinsic motivation is central to self-directed online learning, and this sense of motivation only comes when learners are empowered to make their own learning decisions.

Finally, it is important to note that one of the main things which Doherty, Coyle, & Sharry (2012) cautioned against was focusing too heavily on attrition and engagement, to the detriment of the intervention itself. Researchers that dedicate too much time to creating an online intervention that meets every recommended engagement criterion, often create something that is not representative of real-world situations. For instance, by trying to meet the different and complex needs of people with

mild difficulties, as well as people with severe difficulties, as well as people with multiple difficulties (comorbidity), you create an intervention that may not feel relevant to anyone.

Reducing attrition in online parenting interventions

Online parenting interventions have been proposed as a new and effective way of reaching parents who would otherwise struggle to attend face-to-face parenting interventions. Notably, online interventions have been shown to act as a useful way of engaging fathers, and other groups of parents who are typically difficult to reach, such as single parents and those in conflicted relationships (Dadds et al, 2019). Online parenting interventions may be more suited to these groups of parents as it allows them to overcome practical barriers such as time, and costs of and access to childcare.

Whilst it is encouraging that online therapeutic technologies increase the reach of parenting interventions, it is important to investigate ways in which this participation can be maintained throughout the intervention. One of the most significant factors that have been shown to reduce attrition is the establishment of a support network. As in any intervention, face-to-face or otherwise, creating a sense of connectedness between service users who may otherwise feel disconnected from their peers is a key motivational factor for engagement. There are number of ways in which this can be established online, some of which have been outlined above. With regard to online parenting interventions however, one of the most effective tools is social media (Dittman et al, 2014; Love et al, 2016). In a study by Love et al (2016), which explored ways of maintaining engagement in 'Triple P online', social networking was shown to enable parents to develop relationships with other members of the Triple P community. This kept parents engaged long enough to experience a significant change in parenting style, parenting stress, and child behaviour.

Using social media in this way, however, is not always possible. For example, researchers may have practical reasons for wanting to maintain blindness between service users. Additionally, without regulation, social media can be a place of negativity rather than positivity and support (Richards, Caldwell, & Go, 2015) which may be a risk when offering it as a platform for vulnerable people. As an alternative, connectedness can be established between service users and their therapist online. As highlighted in a study by Doherty, Coyle, & Sharry (2012), even the idea of having a therapist there was often enough to keep service users engaged throughout the intervention and leave them feeling supported and motivated.

Once again, parental perceptions have been shown to have a significant impact on attrition. For example, in a study by Clarke, Calam, Morawska, and Sanders, (2014), parents' perception of the severity of their child's condition was a predictor of engagement with the online intervention. As well as investigating the influence of parental perceptions, the study found a number of practical design factors that influenced attrition. Unsurprisingly this included factors such as the design of the website, the length of the intervention, and the extent to which the intervention was controlled by the clinician or created as a more self-directed learning experience. This reiterates conclusions by Song and Bonk (2016), who explored motivational factors in a more general online learning programme across a range of different users. Allowing parents to explore the online intervention in their own time, and in their own way, (to a certain extent, of course) creates the illusion of control that many people find essential for establishing interest and maintaining engagement.

Conclusions

Research into attrition in online parenting interventions is limited. Many of the findings related to this area are either hard to generalise due to small sample sizes, or not yet shown to be reproducible.

Whilst some of the same trends observed in the literature on face-to-face parenting interventions, can be observed in online parenting interventions, it is important to remain aware of the "uniformity assumption". Though parental expectations, for example, can be seen to influence attrition in both online and face-to-face interventions, with literature on online parenting interventions still scarce, one cannot rely on the assumption that the same predictors will be observed in reality.

A new generation of parents, who have been raised in the age of technology, are ripe for the delivery of parenting interventions online. However, it is essential that more research is carried out, and current findings are adapted and expanded, in order to maximise the impact and efficacy of the relatively new concept that is online parenting interventions.

References

Armbruster, P., & Fallon, T. (1994). Clinical, sociodemographic, and systems risk factors for attrition in a children's mental health clinic. *American Journal of Orthopsychiatry, 64*(4), 577-585.

Baker, C. N., Arnold, D. H., & Meagher, S. (2011). Enrolment and attendance in a parent training prevention program for conduct problems. *Prevention Science, 12*(2), 126-138.

Chacko, A., Jensen, S. A., Lowry, L. S., Cornwell, M., Chimklis, A., Chan, E., ... & Pulgarin, B. (2016). Engagement in behavioral parent training: Review of the literature and implications for practice. *Clinical Child and Family Psychology Review, 19*(3), 204-215.

Clarke, S. A., Calam, R., Morawska, A., & Sanders, M. (2014). Developing web-based Triple P 'Positive Parenting Programme 'for families of children with asthma. *Child: care, health and development, 40*(4), 492-497.

Dadds, M. R., Sicouri, G., Piotrowska, P. J., Collins, D. A., Hawes, D. J., Moul, C., ... & Tully, L. A. (2019). Keeping parents involved: predicting attrition in a self-directed, online program for childhood conduct problems. *Journal of Clinical Child & Adolescent Psychology, 48*(6), 881-893.

Dittman, C. K., Farruggia, S. P., Palmer, M. L., Sanders, M. R., & Keown, L. J. (2014). Predicting success in an online parenting intervention: *The role of child, parent, and family factors. Journal of Family Psychology, 28*(2), 236.

Doherty, G., Coyle, D., & Sharry, J. (2012, May). Engagement with online mental health interventions: an exploratory clinical study of a treatment for depression. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1421-1430).

Fernandez, M. A., & Eyberg, S. M. (2009). Predicting treatment and follow-up attrition in parent–child interaction therapy. *Journal of Abnormal Child Psychology, 37*(3), 431-441.

Geraghty, A. W., Torres, L. D., Leykin, Y., Pérez-Stable, E. J., & Muñoz, R. F. (2013). Understanding attrition from international internet health interventions: a step towards global eHealth. *Health promotion international, 28*(3), 442-452.

Gustavson, K., von Soest, T., Karevold, E., & Røysamb, E. (2012). Attrition and generalizability in longitudinal studies: findings from a 15-year population-based study and a Monte Carlo simulation study. *BMC public health, 12*(1), 918.

Harris, P. M. (1998). Attrition revisited. *American Journal of Evaluation*, 19(3), 293-305.

Howard, K. I., Krause, M. S., & Orlinsky, D. E. (1986). The attrition dilemma: Toward a new strategy for psychotherapy research. *Journal of Consulting and Clinical Psychology*, 54(1), 106.

Kane, G. A., Wood, V. A., & Barlow, J. (2007). Parenting programmes: a systematic review and synthesis of qualitative research. *Child: care, health and development, 33*(6), 784-793.

Kazdin, A. E., Holland, L., & Crowley, M. (1997). Family experience of barriers to treatment and premature termination from child therapy. *Journal of consulting and clinical psychology, 65*(3), 453.

Kizilcec, R. F., & Halawa, S. (2015, March). Attrition and achievement gaps in online learning. In *Proceedings of the Second* (2015) ACM Conference on Learning@ Scale (pp. 57-66).

Love, S. M., Sanders, M. R., Turner, K. M., Maurange, M., Knott, T., Prinz, R., ... & Ainsworth, A. T. (2016). Social media and gamification: Engaging vulnerable parents in an online evidence-based parenting program. *Child abuse & neglect, 53*, 95-107.

Morawska, A., & Sanders, M. (2006). A review of parental engagement in parenting interventions and strategies to promote it. *Journal of Children's Services, 1*(1), 29-40.

Nock, M. K., & Kazdin, A. E. (2001). Parent expectancies for child therapy: Assessment and relation to participation in treatment. *Journal of Child and Family Studies, 10*(2), 155-180.

Richards, D., Caldwell, P. H., & Go, H. (2015). Impact of social media on the health of children and young people. *Journal of paediatrics and child health, 51*(12), 1152-1157.

Sanders, M. R. (2010). Adopting a public health approach to the delivery of evidence-based parenting interventions. *Canadian Psychology/Psychologie canadienne, 51*(1), 17.

Song, D., & Bonk, C. J. (2016). Motivational factors in self-directed informal learning from online learning resources. *Cogent Education, 3*(1), 1205838.

Snow, J. N., Frey, M. R., & Kern, R. M. (2002). Attrition, financial incentives, and parent education. *The Family Journal, 10*(4), 373-378.

Spoth, R., Redmond, C., Hockaday, C., & Shin, C. Y. (1996). Barriers to participation in family skills preventive interventions and their evaluations: A replication and extension. *Family relations*, 247-254.

Tully, L. A., & Hunt, C. (2016). Brief parenting interventions for children at risk of externalizing behavior problems: A systematic review. *Journal of Child and Family Studies, 25*(3), 705-719.

van‘t Hof, E., Cuijpers, P., & Stein, D. J. (2009). Self-help and Internet-guided interventions in depression and anxiety disorders: a systematic review of meta-analyses. *CNS spectrums, 14*(S3), 34-40.