Parental Loneliness, Psychological Wellbeing and Social Identification: The Impact of Online Support Groups

Elizabeth Sara Hernandez

May 2022

Research submitted in partial fulfilment of the requirements for the degree of Doctor in Clinical Psychology (DClinPsy), Royal Holloway, University of London.

Acknowledgements

I would like to thank several people, all of whom made this project possible. Firstly, thank you to my research supervisors, Professor Helen Pote and Professor Roz Shafran, for their thorough supervision and encouragement throughout this project. Thank you also to the participants who gave up their time to participate in the study.

Thank you to my fellow trainees and dear friends in the 2019 RHUL Cohort, whose knowledge, support and humour has been invaluable throughout clinical training.

Lastly, thank you to my wonderful family and friends. I would particularly like to thank my parents for their unwavering support throughout this process and beyond. I would not have reached this point without your encouragement and belief in me. I am forever grateful for your guidance.

Table of Contents

Table of Tables and Figures

Lay Summary

The current project investigates the relationship between parents’ use of online peer support groups and psychological outcomes. Part one is a systematic review investigating the impact of online parent-parent peer support on parents’ psychological outcomes. Part two is an empirical study examining the relationship between parents’ use of online support groups (OSGs) and levels of loneliness, depression, stress and anxiety. The degree to which they identify with fellow group members is also investigated. Part three integrates both sections and discusses their impact and the plan for dissemination of the findings.

Part One: The Impact of Online Peer Support on Parents' Psychological Outcomes: A Systematic Review

Parents’ psychological wellbeing has an important impact on their children’s health. Parents’ mental health has been found to be associated with their children’s levels of anxiety and depression (Feder et al., 2009), emotional and behavioural problems in school (Weitzman, 2011), Post Traumatic Stress Disorder (PTSD) (Fear & Wessely, 2017) and peer problems (Mensah & Kiernan, 2010) throughout childhood. It is important to identify effective support for parents’ mental health and coping. Support from peers, peer support, has been found to be effective in improving individuals’ wellbeing across various populations (Pfeiffer et al., 2011).

Peer support can be defined as the existence of a community of common interest where individuals give and receive help, ask questions and share experiences (Dale et al., 2008). It involves the bringing together of individuals with shared experiences in a non-hierarchical setting. Peer support for parents can range from informal, parent-driven approaches to groups that are developed and run by health professionals (Doull et al., 2005). The increase in internet usage and social media platforms over recent years has meant that peer support for parents can be provided on accessible platforms without any geographical or practical barriers (Nieuwboer et al., 2013). Despite this increased accessibility, little research has focused on the psychological outcomes associated with online peer support for parents. Therefore, the impact on parents' psychological wellbeing remains unknown. A previous review (Niela-Vilén et al., 2014) investigated online parental peer support, however the authors did not focus on studies that had included psychological outcome measures. This review was also in need of updating due to the development in online-based support services over the last eight years.

The current review sought to identify studies published since 2014 to address the following question: what is the impact of online peer support on parents' psychological outcomes? Psychological outcomes included:

- Parents' mental health/stress/quality of life
- Loneliness
- Perceived coping skills
- Parenting (i.e., confidence in parenting skills)

1257 total studies were identified following a search of two online databases. Of these, 15 studies were found to meet the inclusion criteria. A wide range of peer support interventions and psychological outcomes were reviewed. Only one experimental study reported that the online peer support was better at improving parents' anxiety and depression compared to a group that received no intervention. Eight non-experimental studies reported positive findings in relation to parents' psychological outcomes, however these studies did not compare the peer support to another group.

The review concluded that the effectiveness of online peer support on parents' psychological outcomes largely remains inconclusive due to the lack of high-quality, experimental studies that have achieved positive outcomes. Given the large amount of formalised and parent-led peer support incentives that currently exist in the online space, there is a need for future research to fill this gap in order to fully understand the maximised potential of online peer support for parents.

Part Two: Parental Loneliness, Psychological Wellbeing and Social Identification: The Impact of Online Support Groups

Loneliness is increasingly recognised as a problem in society due to the negative consequences it has on individuals' general health and wellbeing. The internet offers various ways for individuals to connect and identify with each other, which can have a positive impact on feelings of loneliness. Similar to the online parent peer support described above, numerous online support groups (OSGs) exist for parents to connect and share advice. These have been defined as: virtual social spaces where people come together to get and give information or support, to learn, or to find company (Preece et al., 2003). The current study aimed to explore the relationship between parents' use of such OSGs and their levels of loneliness. Additionally, it aimed to investigate whether the extent to which parents identified with other members of the OSGs (social identification levels), as well as their depression, stress and anxiety levels, had an influence on this relationship.

Parents of children aged 5 – 18 years completed a questionnaire. No relationship was found between parents' loneliness and (i) the number of minutes spent using OSGs per day and (ii) the number of posts written on OSGs per week. Parents' social identification, depression, stress, or anxiety levels did not influence this relationship. However, depression, stress and anxiety were found to be related to parents' loneliness levels.

These findings suggest that the OSGs visited by participants in the current study are not related to their levels of loneliness, and neither to their stress, depression and anxiety levels. They also indicate that the level to which parents identify with other parents in the OSGs is not important in determining the presence of this relationship. These conclusions raise questions surrounding the nature of the OSGs investigated in the current study and whether the same results would be found in the investigation of other forms of online support for parents or face-to-face groups.

Part Three: Integration, Impact, and Dissemination

The systematic review and empirical project are closely related given the focus on online support for parents and both indicate that future research needs to be conducted in this field given the growing recognition of the potential of the internet regarding the provision of health-related services. It is hoped that future studies will establish whether online peer support services can reduce parents' loneliness, as well as continue to identify factors that can influence the degree to which parents identify with other parents in such OSG settings.

Findings have been presented to clinical psychology trainees at Royal Holloway and both the systematic review and empirical project will be submitted for publication. It is also hoped that the findings will be presented at upcoming conferences focusing on digital interventions and mental health.

The Impact of Online Peer Support on Parents' Psychological Outcomes: A Systematic Review

Abstract

Background: Peer support between parents is an important source of emotional and informational support. It has been found that parents want to share their experiences and receive support from other parents in similar positions as much as they want to seek advice from professionals. In an era when individuals worldwide are spending increasing amounts of time online, the internet provides various opportunities for online parent peer support. Previous systematic reviews have looked the broad impact of such interventions, but none have solely focused on the impact engaging in online peer support exerts on parents' psychological outcomes.

Methods: Studies were identified through a systematic literature search of online databases PubMed and PsychInfo, as well as hand searching of reference lists. Quantitative studies included in this review were published between January 2014 – January 2022, investigated online peer support for parents and included at least one psychological outcome measure administered to parents.

Results: 15 studies (*N* = 1279 participants) were identified that met eligibility criteria out of 1257 total records. These studies were highly variable in terms of study design and investigated a wide range of peer support interventions and psychological outcomes. Non-RCT studies provided some evidence that parent peer support exerted positive effects on parents' psychological outcomes, but the same conclusion could not be drawn from the included RCT studies.

Conclusion: Online parent peer support may have a positive impact on parents' psychological outcomes, however there is a need for future high-quality studies to delineate how such interventions may work and whether they can be stand-alone interventions for this population or used in conjunction with existing mental health services.

Introduction

The transition to parenthood is frequently cited as one of life's most significant challenges (Lévesque et al., 2020). For mothers, pregnancy and the adjustment to parenting is a time of rapid physiological, psychological and social change (Otchet et al., 1999; Yan et al., 2020) and a period that has long been associated with an elevated vulnerability to depression, anxiety and stress (Della Vedova et al., 2011; Evans, 2001; Figueiredo & Conde, 2011; Giardinelli et al., 2012) alongside other comorbid mental health symptomatology (Abdollahi et al., 2016; Andersson et al., 2006). In addition to exerting a cumulative impact on mothers' wellbeing and quality of life (Sadat et al., 2014), these experiences are also associated with adverse child outcomes, such as impaired cognitive, behavioural and emotional development (Alhusen, 2013; Davis et al., 2011; Keim et al., 2011), mother-infant attachment problems (Akman et al., 2006; Rubertsson et al., 2014) and internalising and externalising disorders (Fihrer et al., 2009; Prenoveau et al., 2017). Despite a large proportion of studies to date focusing on mothers' experiences in the pre- and post-natal period, there is a growing shift of attention towards fathers' wellbeing during this transition and both mothers' and fathers' coping throughout parenthood.

Approximately 5 – 10% of fathers experience depression in the perinatal period (that is, the period spanning pregnancy, childbirth, and the first postnatal year) and 5 – 15% experience anxiety symptoms (Leach et al., 2016; Paulson, 2010). High prevalence rates of paternal stress have also been estimated across populations (Philpott et al., 2017). Critically, there exists a positive correlation between maternal and paternal mental health, and it has been found that paternal wellbeing can be a protective factor against the development of maternal perinatal mental health problems and their effects on child outcomes (Darwin et al., 2017;

Melrose, 2010). This relationship and the association between parent and child outcomes more generally (Nicholson et al., 2010) indicates that the promotion of both mothers' and fathers' wellbeing throughout the perinatal period is of paramount importance (Domoney, 2018).

The perinatal period has long been indicated as being a critical period in infant development, during which infants may be more susceptible to the effects of parental mental health difficulties partly due to the rapid and substantial neural, cognitive and socio-emotional developments that occur during this time (Sroufe, 2005; Talge et al., 2007). However, parents' experience of stress and/or mental health difficulties is not limited to this specific period, and neither are the associated detrimental effects on child outcomes. There is evidence that child sensitivity to parental wellbeing continues up to, and beyond, the age of five years – for example, a longitudinal Canadian study of 937 adolescents found that those who were initially exposed to parental depression between the ages of two and five years were twice as likely to develop affective disorders in adolescence compared to those not exposed to parental depression (Naicker et al., 2012). There are high rates of intergenerational transmission of mental health problems in children beyond five years of age, such as anxiety, depression (Feder et al., 2009; Gonçalves et al., 2016; Lawrence et al., 2019) and PTSD (Fear & Wessely, 2017; O'Toole et al., 2017). Furthermore, emotional and behavioural problems in school (Weitzman, 2011), poorer academic performance (Doctoroff et al., 2006; Metsäpelto et al., 2015), peer problems (Mensah & Kiernan, 2010) and internalising problems (Ramchandani et al., 2005) in school-aged children have all been found to be associated with parental mental health difficulties and/or high levels of parental stress occurring when children are aged five – 18 years old (Crum & Moreland, 2017), indicating that parents' psychological wellbeing can be an important predictor of children's outcomes throughout the duration of childhood (Kamis, 2021).

Certain factors have been cited in the literature to increase the likelihood of parents exhibiting poorer psychological health. These include family environments where there is increased caregiver strain due to having a child with additional needs (Feizi, 2014). For instance, parents of children with developmental disabilities (Woodman et al., 2015), physical disabilities (Beckers et al., 2022), mental health needs (Eaton et al., 2016) or chronic health conditions (Cousino & Hazen, 2013) have been reported to be at an elevated risk of psychological health problems when compared to parents of children without additional needs (Hayes & Watson, 2013). These parental difficulties, including stress, anxiety and depression, are likely to be pervasive and worsen over time (Brehaut et al., 2011; Brehaut et al., 2009). Recognising the groups of parents more likely to be affected by poorer psychological health and the implications poor parent wellbeing exerts on child outcomes calls for attention to be paid to factors that can positively influence parental mental health and coping. Peer support is one of such factors which has been found to play an important and protective role in ameliorating psychological wellbeing across different parent populations (Shilling et al., 2013; Wang et al., 2020).

Parent Peer Support

Peer support aims to be a source of holistic, parent-centred informational and emotional support (Dennis, 2003; Kingsnorth et al., 2011; Law et al., 2002; Rossman, 2007). It can be defined as the existence of a community of common interest where individuals give and receive help, ask questions and share experiences (Dale et al., 2008; Eysenbach, 2004; Mead, 2001). The social emotional support that is provided is voluntary, informal, flexible, non-hierarchical and non-medical (Fortuna et al., 2022; Mead & MacNeil, 2006). Peer support is a well-established modality for improving outcomes in individuals with a wide range of risk factors and diagnoses, such as improved mental health outcomes and quality of life in inpatients in adult mental health settings (Bouchard et al., 2010), improvement in diabetes symptom management (Dale et al., 2008; Fisher et al., 2012) and improved anxiety, depression, stress and quality of life outcomes in individuals with multiple sclerosis (Ng et al., 2013).

Peer support interventions for parents can range from informal, parent-driven approaches to those that are more formalised, model-orientated and facilitated by professionals (Doull et al., 2005). Along this continuum, the emphasis on the sharing of personal experience in the provision of peer support remains constant. Shilling et al.'s (2013) review of the benefits associated with peer support for parents of children with chronic disabling conditions concluded that there were four consistent themes that appeared to be generic across the many different modes of peer support and medical conditions in the 17 included studies: (1) social identity, (2) learning from the experiences of others, (3) personal growth and (4) supporting others. The shared social identity reported by parents is consistent with findings from non-parent participants in peer support interventions (Bliuc et al., 2020; Su et al., 2022). It is documented as fostering a sense of belonging, support and empowerment, enabling parents to feel better able to cope and have reduced feelings of isolation, loneliness and guilt (Kingsnorth et al., 2011; Nicholas & Keilty, 2007), as well as providing a safe space for support at key times, such as starting school (Bull, 2003) and transitioning between health services (Kingsnorth et al., 2011). Although not quantitively measured, Shilling and colleagues (2013) commented that a common finding across studies was parents perceiving peer support interventions as being less successful when there was not a close match in parents' experiences. That is, when parents perceived differences in the challenges faced by their children or themselves or in their own qualities and values (Ainbinder et al., 1998; Nicholas & Keilty, 2007).

As with peer support interventions for other population groups (Bracke et al., 2008), the sharing of practical information and problem-solving is an important element of parent peer support and is found to be empowering and reassuring for less experienced parents, increasing their confidence and self-efficacy (Rearick et al., 2011; Sullivan-Bolyai & Lee, 2011). Likewise, Shilling et al. (2013) commented that the development of increased confidence, sense of control and motivation (Solomon et al., 2001) was apparent across many parent-parent peer support studies and that it was this personal growth that contributed towards parents' positive feelings towards the peer support intervention. Lastly, in relation to the 'supporting others' theme, the benefits of parental peer support are not restricted to those receiving support. In several studies reviewed by Shilling et al. (2013), parents commented that offering others support validated their expertise as parents (Lo, 2010) and increased their feelings of self-worth (Ireys et al., 2001; Law et al., 2001). This process also enabled parents to reflect on their past challenges and how much progress they had made in their parenting journey (Sullivan-Bolyai & Lee, 2011).

Shilling and colleagues' (2013) review included studies that had reported parent peer support as being associated with social and practical support (Heiman & Berger, 2008; Kerr & McIntosh, 2000), problem-solving skills (Palit & Chatterjee, 2006), empathetic understanding (Solomon et al., 2001), reduced feelings of isolation (Nicholas & Keilty, 2007), enhanced self-efficacy (Resendez et al., 2000). One study reported significantly lower stress, depression and anxiety in mothers of preterm babies who received parent-parent peer support compared to mothers in a control group (Preyde & Ardal, 2003), however the authors noted the lack of robust quantitative evidence on the psychological, emotional and other health outcomes of parent-parent peer support.

Since Shilling et al.'s (2013) review there has been an increased focus on the psychological outcomes associated with parents' engagement in parent-parent peer support interventions. Bray and colleagues (2017) evaluated a peer support scheme that was designed to help parents of disabled children understand their feelings about their child's disability, make positive changes to their own and their family's lives and promote parental mental health and wellbeing. Trained parent volunteers (befrienders) facilitated eight one-to-one support sessions. In their sample of 26 parents, they found that scores on measures of parental stress and psychological distress significantly reduced and scores on measures of quality of life and ability to cope with their child's disability significantly increased following the eight-week intervention. Chakraborti et al. (2021) reviewed studies that had investigated peer support for families of children with neurodevelopmental and intellectual disabilities. Comparable themes emerged as to those described above regarding Shilling et al.'s (2013) review and the authors noted that the quantitative studies showed benefits relating to improved psychological wellbeing, coping and empowerment amongst parents. However, the small sample size and exploratory nature of many of the studies was highlighted. Sartore et al. (2021) conducted a Cochrane review into peer support interventions for parents of children with complex needs and were unable to conclude clear evidence of the effects of peer support interventions on any parent outcome. Reviewing 22 studies (21 RCTs and one quasi-RCT), the pooled estimates of effect lacked significance in their meta-analysis. The authors also commented on the frequent small sample sizes and the existing evidence from quantitative studies being of low or very low certainty. However, they also made reference to the large amount of qualitative data suggesting that parents value peer support interventions, particularly when they are provided by peers perceived as available, approachable and with similar experiences to themselves.

It is evident that the research into peer support interventions for particular populations of parents is inconclusive and lacking in robust methodological quality. However, it is worth noting that such conclusions have been drawn from reviews of studies involving parents of children with complex needs and the same conclusions cannot be made regarding parents in general due to the dearth of reviews conducted within a general parent population. Additionally, systematic reviews on the efficacy of peer support interventions in the perinatal period have yielded positive conclusions relating to the reduction of depressive symptomatology (Huang et al., 2020; Jones et al., 2014), therefore one can argue that further consideration into different forms of peer support interventions throughout childhood is warranted.

In the current era of prominent social media use in many people's everyday lives, the internet provides numerous opportunities for peer support across multiple populations. As of January 2022, there exists 4.95 billion internet users worldwide, equating to 62.5% of the global population. Of this total, 4.62 billion are social media users (Kemp, 2022). Parents have been reported to be leading internet users over and above nonparents (Allen & Rainie, 2002) and recent years have seen a rise in the provision of online parenting support websites, ranging from one-to-one discussion formats to open group forums (Nieuwboer et al., 2013). It is therefore important to consider how parents may use the internet to seek out and access parent-to-parent peer support.

Online Parent Peer Support

The growing accessibility of the internet, together with the advantages of offline peer support (Lloyd-Evans et al., 2014; Miyamoto & Sono, 2012; Pfeiffer et al., 2011), has increased the development of internet peer support groups in recent years (Smit et al., 2021). In the absence of any geographical or time constraints, these online communities can be accessed by diverse groups of people. There is also a large amount of diversity in the qualities of such online peer support groups – they can be public online spaces, open to all internet-users, or more private groups that are only open for specific groups of people. Individuals with mental health difficulties such as depression (DeAndrea & Anthony, 2013) and health difficulties such as cancer (Ihrig et al., 2020), have been found to be over-represented amongst adult online peer support help seekers. However, there is also evidence to suggest that online peer support groups can be effective for young people with mental health difficulties (Ali et al., 2015) as well as parents (Nieuwboer et al., 2013).

Several authors have previously suggested that the internet could be a useful forum for the delivery of parenting support in an accessible, cost-effective and helpful way, due to the benefits of being able to access it regardless of the time of day or location (and therefore easily fitting in with parents' often busy schedules) and the potential to share information and seek advice in an anonymous setting (Daneback & Plantin, 2008; Funderburk et al., 2008; Plantin & Daneback, 2009; Scharer, 2005). Nieuwboer and colleagues (2013) comment on the various different forms of parenting support the internet can provide – they describe web-based programmes as offering various types of online communication, for example, by means of direct messaging, confidential chatrooms, email lists, discussion boards and information pages. There can be chatrooms whereby parents exchange direct messages with each other, or open, user-driven discussion forums (such as ‘Mumsnet’, which has 7 million unique monthly visitors; Mumsnet, 2022) whereby participants can start a ‘thread’ or ‘discussion topic’ for other parents to reply to. These often take the themes of help- or advice-seeking and emotional support (Croucher et al., 2020) and allow parents to exchange personal experiences in an open, but confidential, way. Rollercoaster Family Support is a parent-led, professionally support peer support project that was set up by parents supporting their children with mental health difficulties. It is comprised of various elements, including online video sessions, telephone support and social media components. A recent evaluation of the project indicated that a large proportion of respondents (over 80%) offered positive feedback, with parents frequently commenting on the non-judgemental atmosphere and how this facilitated engagement. The report also demonstrated that the private Facebook group contained 1700 parents, which is a large number and reflects the need for such support given the geographical focus on mainly providing support for Country Durham (Rollercoaster, 2022).

Previous Systematic Reviews

To date there have been few systematic reviews conducted that purely focus on online (or at least partly online) parent peer support. Two systematic reviews aforementioned (Sartore, et al., 2021; Shilling et al., 2013) focused only on studies involving parents of children with complex needs (and did not include pregnant women) and included both online and offline peer support. Nieuwboer and colleagues (2013) reviewed formalised peer and professional parenting support provided via the internet and concluded that such online interventions can make positive contributions to parenting skills. In their meta-analysis of 19 studies published between 2000 and 2010, a statistically significant medium effect was found across parent outcomes (relating to parenting knowledge and attitude) and child behavioural outcomes, which the authors concluded indicated effectiveness of internet interventions in supporting parents in their parenting role. The authors also highlighted the common limitations across studies included in the reviews, specifically relating to bias that may have been present in analysis due to the interventions often being developed by the researchers. Furthermore, most reviewed studies had small sample sizes and reported uneven attrition rates.

Niela-Vilén et al. (2014) reviewed the outcomes of 38 studies that had investigated internet-based peer support for parents. Their inclusion criteria were as follows: (1) an Internet-based community as an intervention, or at least as a component of an intervention; (2) the participants in the Internet-based community had to be mothers and/or fathers or pregnant women; (3) the parents had to interact and communicate with each other through the Internet-based community. The authors performed a content analysis and noted the variety and diversity of internet-based peer support for parents, in line with Nieuwboer et al. (2013), which can be synchronous or asynchronous, use real-time videoconferencing or an e-mail chain, moderated or non-moderated and open to a wide population or targeted to a certain group of parents. The evidence of the effectiveness of the internet-based peer support was deemed to be inconclusive due to the limited number of experimental designs.

An update and extension of this review is warranted for a number of reasons. Firstly, the number of internet users worldwide is continuously growing at a remarkable rate since 2014, rising just under 5 billion at the start of 2022 (Kemp, 2022) and 87% adults in 2019/2020 reporting the regular use of social media compared to just 54% eight years ago (Office for National Statistics, 2021). Beyond the number of internet-users increasing, it has been suggested that the internet is being used in increasingly social ways due to the growing availability to virtually connect with others on multiple platforms on both phones and computers (Ørmen et al., 2021). Secondly, the COVID-19 pandemic saw an increased reliance on digital technology for access to both physical and mental health services, thus over the last two years there has been renewed interest in understanding the role that online peer support communities could play in bridging service gaps (Merchant et al., 2022).

Third, the evaluation of interventions outside of conventional care is crucial given the increasing demand for mental health services after mental health concerns were exacerbated by the pandemic (Panchal et al., 2020). The NHS Long Term Plan (Alderwick & Dixon, 2019) emphasises digital and community focused approaches to mental health care as an important first-line priority for the NHS over the next 10 years. There is a crucial need to fully understand the impact of accessible online peer support services on psychological outcomes in order to sufficiently plan for services to meet the needs of varying populations utilising digital methods. Finally, previous reviews carried out to date have included both qualitative and quantitative studies and have not limited their focus on studies that have included a measure of parents' psychological wellbeing (Niela-Vilén et al., 2014). As such, there has not been concise synthesis of up-to-date data regarding parents' psychological outcomes which can inform the development of future online parental peer support for both clinical and non-clinical populations.

Current review

The current review aims to update and expand on Niela-Vilén et al.'s (2014) review by reviewing articles published since 2014 focussing on only those that have administered at least one psychological outcome measure to a parent population. The following question will be answered: What is the impact of online peer support on parents' psychological outcomes?

Method

The systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA guidelines; Liberati et al., 2009).

Source of Information

Several scoping searches of both published and unpublished grey literature were conducted. The EThOS database, containing doctoral theses, was searched but no relevant papers were identified. In consultation with my supervisors, it was agreed to focus on published articles to enable a thorough high-quality assessment. Two bibliographic databases were searched for relevant literature that had been published between January 2014 and January 2022. PsychINFO and PubMed databases were chosen in consultation with a specialist subject librarian on the basis that they would contain psychological outcome literature and covered the disciplines of health and social sciences, including the Journal of Paediatric Psychology and the Journal of Medical Internet Research where key papers were published. They had also been searched in Niela-Vilén's et al.'s (2014) review of internet-based peer support for parents. Finally, reference lists of the included papers and other relevant systematic reviews on parental peer support were reviewed to identify any further relevant papers.

Inclusion and Exclusion Criteria

Titles and abstracts were screened using the population and intervention eligibility criteria outlined in the Participants, Intervention, Comparison, Outcomes, Setting and Study Design (i.e., PICOSS) table below (Table 1). Full texts were obtained for records that appeared to be eligible at this stage. Each article was then read and assessed for relevance using the full eligibility criteria and ineligible articles were excluded.

Table 1.

Inclusion and exclusion criteria.

	Inclusion Criteria	Exclusion Criteria
Population	Mothers/fathers/pregnant women. Participants must engage/be invited to engage in an internet-based, peer-support community for parents/pregnant women.	Studies solely related to child outcomes.
Intervention	Presence of an internet-based, peer support community as an intervention or as a component of an intervention where participants can interact and communicate with each other, including (but not limited to) online forums, chat rooms, video groups and social media websites.	Studies that do not contain an internet-based peer support intervention (i.e., face-to-face peer support).
Comparator/Controls	Studies with and without comparison groups.	

Outcomes	At least one psychological outcome measure administered to parent participants (please see Table 5 for examples of measures included).	No measure of parents' psychological outcomes.
Study Design	Randomised controlled trials (RCTs), non-randomised trials, quasi-experimental designs, and observational studies (cohort and single care studies)	Qualitative studies, editorials, news/opinion pieces, conference proceedings, and letters.
Data Collection	Quantitative data	
Setting	Internet-based or virtual (i.e., via a mobile phone app)	
Source	Published studies	Unpublished studies, literature reviews, dissertations, and qualitative research.
Publication date	2014 – February 2022	Prior to 2014.
Language	Published in English.	Not published in English.

Definition of Psychological Outcome Measures

The inclusion criteria relating to the presence of a psychological outcome measure involves a broad term, which can be defined as the effect on an individuals' mental health status attributable to an intervention by a health professional or health service (Andrews et al., 1994). However the variability of such interventions is noted in the literature, including outcomes resulting from self- rather than professional help (Slade, 2002). The variability of definitions relating to ‘mental health’ have also been noted, with psychological measures being attributed to broader aspects of individuals’ mental and emotional states (Warr, 2022). Through conducting scoping searches, it was agreed, along with my supervisors, that studies would be included if they reported data relating to parents’ psychological outcomes in any of the following areas: mental health (including stress and quality of life), perceived loneliness and/or social support, perceived coping skills/ability and psychological parenting outcomes (such as parenting attributions and parenting self-efficacy). Please see Table 5 for a list of the measures included in the review.

Search Strategy

A search strategy was devised based on Niela-Vilén et al.’s (2014) search strategy and agreed in consultation with the specialist librarian and supervisors. Boolean operators were used to combine the relevant population, intervention, and outcome inclusion criteria. Searches were conducted in ‘All Fields/All Text’. The search did not contain any methodological search filters that would limit results to specific study designs. The initial search was undertaken on 09/01/2022 and repeated on 26/02/2022 to ensure no recent publications were missed. The searches conducted in PubMed and PsychINFO are shown in Table 2.

Table 2.

Search conducted in PubMed and PsychINFO on 26/02/2022.

Concept	Search Terms	Searched In
Internet	(internet* OR online* OR web* OR "social media" OR Facebook OR YouTube OR chat* OR blog* OR forum OR "online forum*" OR "online chat group" OR "online group")	All fields

(AND) Peer Support	("peer group" OR "peer support" OR "peer counselling" OR "social support")	All fields
(AND) Parent	(parent* OR mother* OR mum* OR father* OR dad*)	All fields

Process of Study Selection

The records from each database were extracted into EndNote 20. Duplicates were removed and then the remaining records were imported into the Rayyan Systematic Review tool. Titles and abstracts were independently screened for eligibility. 10% of abstracts (*N* = 125) were randomly selected through an online random number generator and later assessed for reliability between the author and a fellow trainee clinical psychologist (Miss Julia Beckwith), who found a good agreement, 97.6%, Kappa = .66 (*p* <.001) (Altman, 1999). Three disagreements were resolved via discussion, which led to the inclusion of one study (Morse & Brown, 2021) for full-text screening. Of the original records, 20 studies were included for full-text independent reviewing. The same second reviewer also assessed 20% of these full texts (*N* = 4), which were selected at random via a random number generator, using the full eligibility criteria. There was agreement on three out of four studies. One study (Miller et al., 2019) was assessed by a third reviewer (Dr Roz Shafran) due to some uncertainty around the outcome variables – that is, whether perceived social support, empathy and homophily are defined as psychological outcomes. This discussion resolved in the inclusion of the article. Data was then extracted into a table and quality assessed

Data Extraction

For each included study, the following details were extracted into an Excel spreadsheet:

Study Information:

- Author
- Year of Publication

Participant Characteristics:

- Population (i.e., mothers/fathers/both/pregnant women)
- Sample size
- Age
- Gender
- Ethnicity
- Location

Study characteristics:

- Design
- Control/comparison
- Description of intervention/peer support group
- Exclusive peer support or part of wider intervention
- Facilitated/moderated or non-facilitated/non-moderated peer support intervention
- Follow up duration

Study results:

- Psychological outcome measure
- Key findings/effect size

Quality Assessment

The quality of the studies included in this review was assessed using validated tools that assess risk of bias across multiple domains. For the RCT studies, the Cochrane revised Risk of Bias Tool (RoB 2; Higgins et al., 2019) was used, while the for the non-RCT studies, the Integrated Quality Criteria for the Review of Multiple Study Designs (ICROMS; Zingg et al., 2016) tool was used. The ROB 2 is structured into five domains: bias arising from the randomisation process; bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement of the outcome, and bias in selection of the reported result. These domains were selected to address all important mechanisms by which bias can be introduced into the results of a trial (Sterne et al., 2019).

The ICROMS tool was chosen to assess the quality of the studies with different methodologies (such as case series and non-randomised controlled trials). The domains include clear aims and justification; managing bias in sampling or between groups; managing bias in outcome measurements and blinding; managing bias in follow-up; managing bias in other study aspects; analytical rigour and managing bias in reporting/ethical consideration.

A meta-analysis was not conducted because of the high methodological heterogeneity between studies. A narrative synthesis of the data is therefore presented.

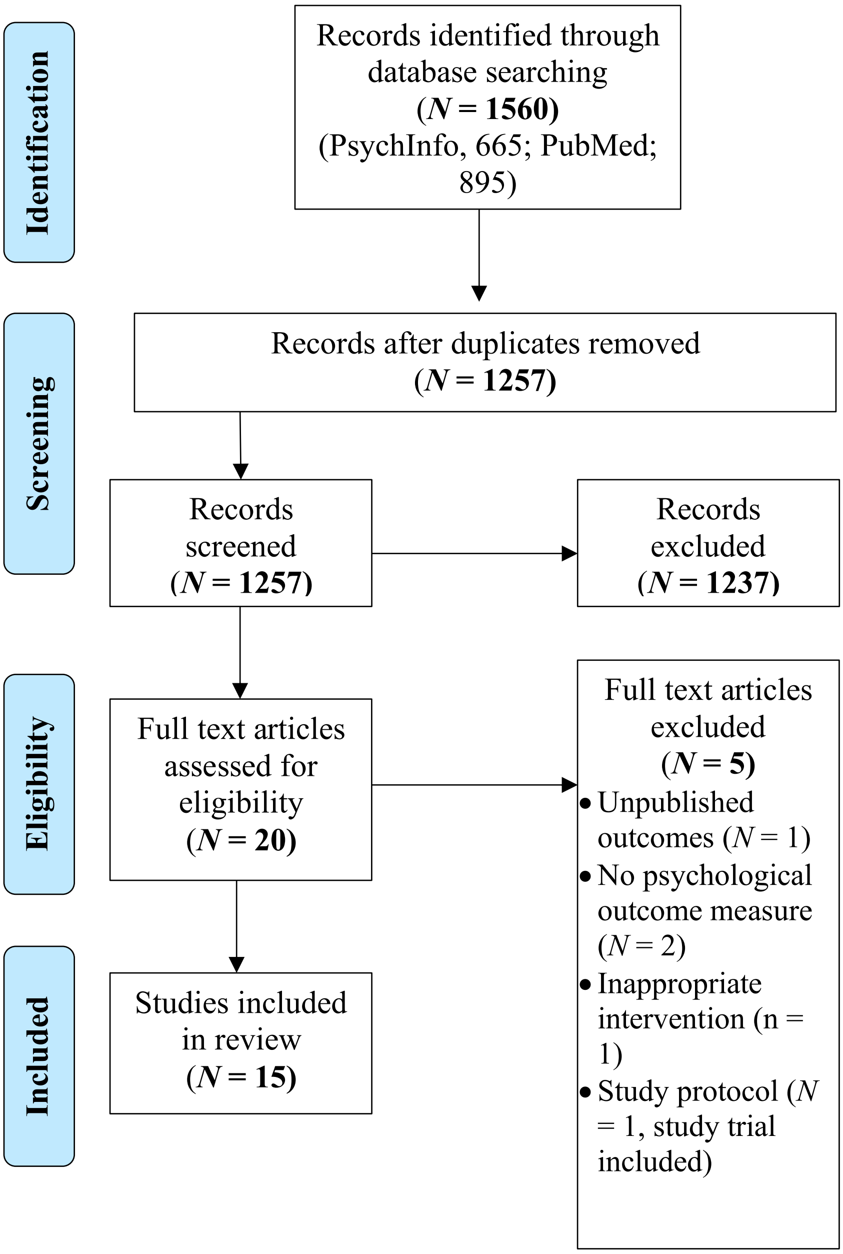
Results

Study Screening

15 studies were included in this review. Electronic searches originally identified 1560 records across two databases and no additional papers were identified through other sources. Duplicates were removed (*N* = 303), leaving 1257 titles and abstracts to be screened (independently and by a second reviewer) for inclusion (see PRISMA flow diagram in Figure 1). This stage resulted in 20 potential citations and full texts for inclusion. The main reason for exclusion was studies clearly not focusing on online peer support for parents, such as studies evaluating face to face peer support interventions, studies involving a different population group or studies without any relevance to the review question at all. After full text screening, a further five papers were excluded due to not meeting the inclusion criteria: one paper did not investigate an online intervention with an interactive peer support element for parents and another study did not administer any psychological outcome measures to parents. Authors of one study were contacted due to the results of the psychological outcome measure not being published in their paper, however no response was received. Lastly, one record was the protocol of a trial which was included in the 15 included papers.

Figure 1.

PRISMA Flow Diagram



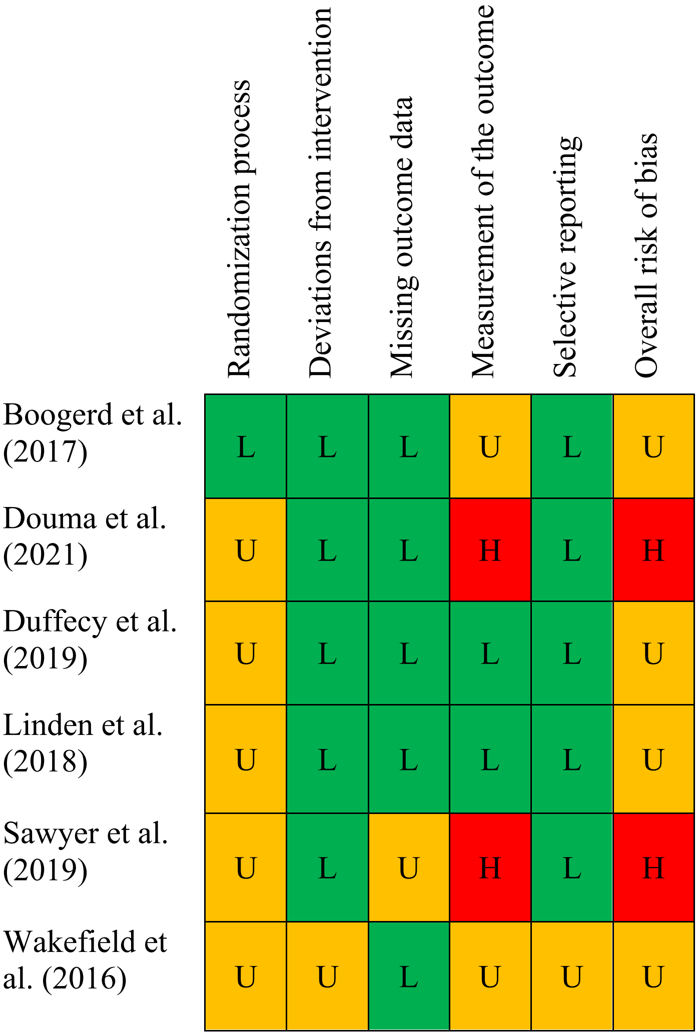
Quality Assessment

The methodological quality of each included study was assessed and reported individually in Figures 2 and 3 for RCTs and other study designs, respectively. Overall, for the six RCTs, two were assessed as having an overall high risk of bias (Douma et al., 2021; Sawyer et al., 2019) and four had some concerns due to a lack of information to make an informed judgement (Boogerd et al., 2017; Duffecy et al., 2019; Linden et al., 2018; Wakefield et al., 2016). Five out of the six studies provided insufficient information regarding randomisation to rule out bias during the randomisation process (Douma et al., 2021; Duffecy et al., 2019; Linden et al., 2018; Sawyer et al., 2019; Wakefield et al., 2016). However, the majority of the studies provided enough information with regards to deviations from the intervention, addressing missing data and reporting to rule out selection, detection, attrition and reporting bias. Two of the studies were deemed high risk of performance bias due to unblinded outcome measurement (Douma et al., 2021; Sawyer et al., 2019).

For the non-RCT designs, the 'mitigation of no control' category was assessed as having either high or unclear bias risk in all nine studies (Balkhi et al., 2014; Holtz et al., 2020; Kosugi et al., 2021; Love et al., 2016; Martin et al., 2017; McKeon et al., 2021; Miller et al., 2019; Wilford et al., 2020; Wilkerson et al., 2020). Seven of these studies made no reference as to why a non-controlled design was chosen or any attempts to correct for this (Balkhi et al., 2014; Holtz et al., 2020; Kosugi et al., 2021; Love et al., 2016; Miller et al., 2019; Wilford et al., 2020; Wilkerson et al., 2020). Three studies were assessed as having unclear risk for the 'incomplete outcome data' category because attrition rates were not reported (Martin et al., 2017; Miller et al., 2019; Wilford et al., 2020). Five out of nine studies were assessed as high risk on the 'ethical issues' category (i.e., ethical approval or procedures not mentioned) (Balkhi et al., 2014; Holtz et al., 2020; Love et al., 2016; Miller et al., 2019; Wilkerson et al., 2020). All studies were assessed as having provided enough information in regards to reliability of outcome measures, modification of data collection, analytical rigour, reporting and addressing to be assessed as low risk. Two studies were found to be high risk in the 'other bias' category, which was around the omission of adequate participant demographics – ethnicity (Kosugi et al., 2021) and age (Martin et al., 2017).

Figure 2.

Quality assessment of RCTs using the Cochrane Risk of Bias Tool 2.

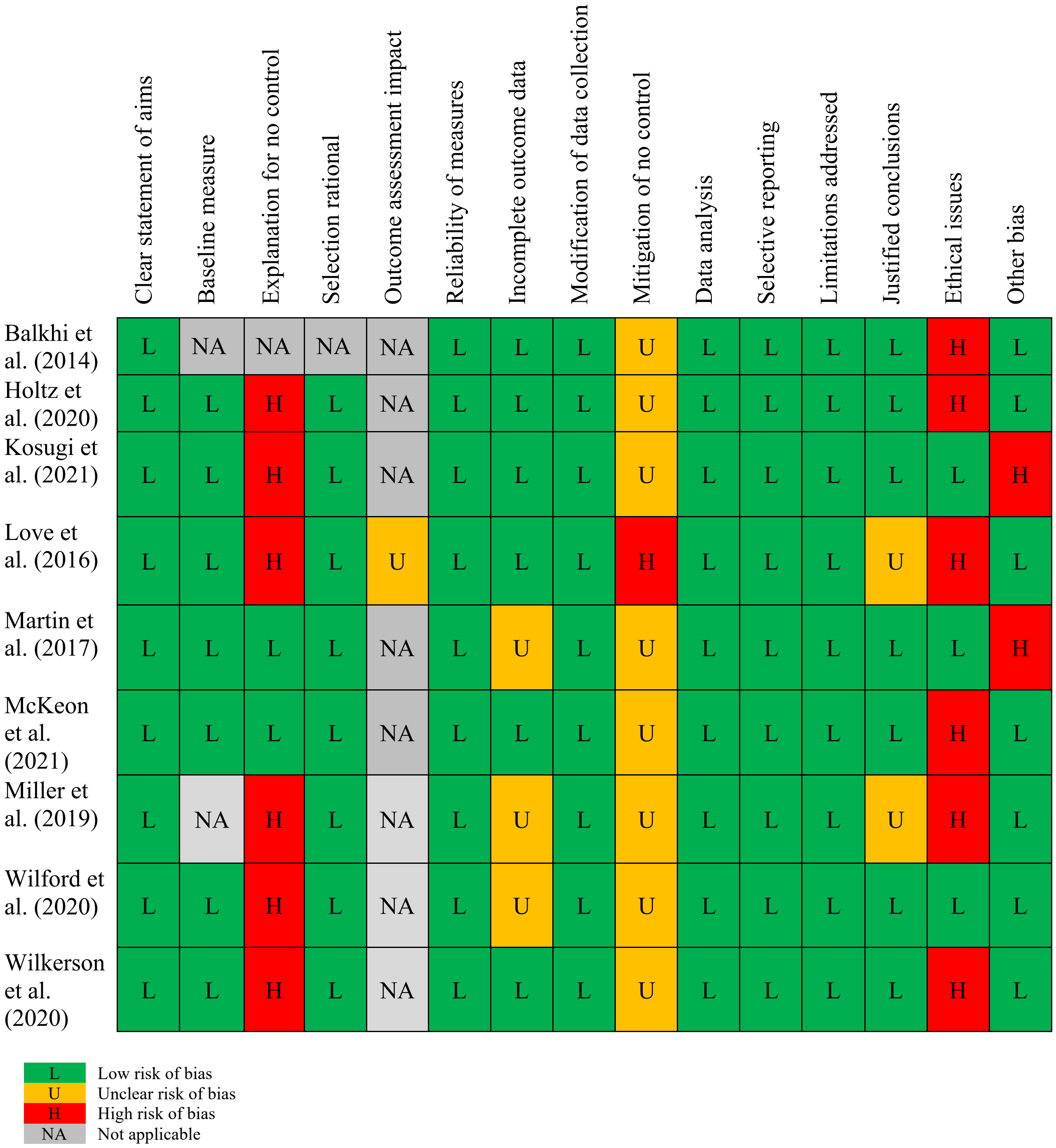


	Randomization process	Deviations from intervention	Missing outcome data	Measurement of the outcome	Selective reporting	Overall risk of bias
Boogerd et al. (2017)	L	L	L	U	L	U
Douma et al. (2021)	U	L	L	H	L	H
Duffecy et al. (2019)	U	L	L	L	L	U
Linden et al. (2018)	U	L	L	L	L	U
Sawyer et al. (2019)	U	L	U	H	L	H
Wakefield et al. (2016)	U	U	L	U	U	U

L	Low risk of bias
U	Unclear risk of bias
H	High risk of bias

Figure 3.

Quality assessment of non-RCT studies using the Integrated Quality Criteria for the Review of Multiple Study Designs.



	Clear statement of aims	Baseline measure	Explanation for no control	Selection rational	Outcome assessment impact	Reliability of measures	Incomplete outcome data	Modification of data collection	Mitigation of no control	Data analysis	Selective reporting	Limitations addressed	Justified conclusions	Ethical issues	Other bias
Balkhi et al. (2014)	L	NA	NA	NA	NA	L	L	L	U	L	L	L	L	H	L
Holtz et al. (2020)	L	L	H	L	NA	L	L	L	U	L	L	L	L	H	L
Kosugi et al. (2021)	L	L	H	L	NA	L	L	L	U	L	L	L	L	L	H
Love et al. (2016)	L	L	H	L	U	L	L	L	H	L	L	L	U	H	L
Martin et al. (2017)	L	L	L	L	NA	L	U	L	U	L	L	L	L	L	H
McKeon et al. (2021)	L	L	L	L	NA	L	L	L	U	L	L	L	L	H	L
Miller et al. (2019)	L	NA	H	L	NA	L	U	L	U	L	L	L	U	H	L
Wilford et al. (2020)	L	L	H	L	NA	L	U	L	U	L	L	L	L	L	L
Wilkerson et al. (2020)	L	L	H	L	NA	L	L	L	U	L	L	L	L	H	L

L	Low risk of bias
U	Unclear risk of bias
H	High risk of bias
NA	Not applicable

Participant Characteristics

The total number of participants in the included studies was 1279, with sample sizes ranging from 11 to 334 (Mean = 85.27**).** The majority of included studies invited both mothers and fathers to participate (*N* = 12), with two studies focusing on pregnant women (Duffecy et al., 2019; Linden et al., 2018) and one study on mothers only (Sawyer et al., 2019). The total numbers of mothers who participated in the included studies was 1067 (across 15 studies), compared to 212 fathers. Participant age was not provided in two studies, for the remaining studies mean age was most commonly reported (*M* = 37.79 years). Participants' ethnicity was only reported in six of the included studies, with Caucasian participants being the majority. Of the 13 included studies, the majority were conducted in the USA (*N* = 7), with two studies from Australia, two from The Netherlands, one from Japan and one from Sweden.

The majority of studies did not report the number of children of participants (*N* = 9). The studies that did (*N* = 4) reported mostly one child per family (*M* = 1). The age of children, where reported and excluding the two studies on pregnant women (*N* = 11), ranged from two months old – 23 years old. Eight studies involved parents of children diagnosed with various health conditions, such as Type 1 Diabetes and cancer. Detailed participant characteristics are further reported in Table 4.

Study Characteristics

Study designs and analyses

Six studies were randomised controlled trials (RCTs), seven utilised a single group repeated measures design and two were cross-sectional surveys. Of the six RCTs, three had treatment as usual control groups (Boogerd et al., 2017; Linden et al., 2018; Sawyer et al., 2019), two had waitlist control groups (Douma et al., 2021; Wakefield et al., 2016) and one had an active comparison group (Duffecy et al., 2019).

The two cross-sectional survey studies collected responses at one timepoint (Balkhi et al., 2014; Kosugi et al., 2021), two studies collected data pre- and post- the internet peer support intervention (Holtz et al., 2020; Wilkerson et al., 2020) and the remaining studies had more than one follow-up timepoint: Boogerd et al. (2017) and Douma et al. (2021) collected data at 6- and 12-months follow up, Love et al. (2016) collected data post-intervention (12 weeks) and at six-months follow up, Martin et al. (2017) collected data post-intervention (8 weeks) and at three-months follow up, McKeon et al. (2021) collected data post intervention (4 weeks) and at four-weeks follow up, Wakefield et al. (2016) collected data at post-intervention (2 weeks) and at six-months follow up, Wilford et al. (2020) collected data post-intervention (one week) and at three-months follow up and Sawyer et al. (2019) collected data post-intervention (8 months) at 12-months follow up. Two studies collected data at post-birth timepoints (Martin et al., 2017; Wilford et al., 2020): four and six weeks, and two- and six-months post-birth, respectively.

11 out of the 15 included studies achieved a good response rate post-intervention (i.e., 70 – 90%). One pilot study stated expressly that it was not powered to evaluate the efficacy of the intervention but conducted preliminary analyses to assess its impact (Wakefield et al., 2016).

Most of the studies made no reference to power calculations. Eight of the 15 included studies were pilot studies. Three studies used intention to treat analyses. Studies analysed data using ANOVAs (*N* = 4), paired samples t-tests (*N* = 3), multiple regression (*N* = 2), linear mixed model analyses (*N* = 1), MANOVA (*N* = 1), Pearson correlation (*N* = 1) and non-parametric tests (*N* = 1).

Online Peer Support Interventions

The majority of the studies examined online peer support provided as part of wider interventions developed by the researchers (*N* = 11). Of these studies, seven developed websites or apps of which interactive peer support was one of the components of the intervention (e.g., an online parenting programme, a web-based patient portal focusing on diabetes and an interactive app for new mothers) (Boogerd et al., 2017; Holtz et al., 2020; Linden et al., 2018; Love et al., 2016; McKeon et al., 2021; Sawyer et al., 2019; Wilkerson et al., 2020). Two studies consisted of manualised group online therapy sessions based on cognitive-behavioural therapy (CBT) and acceptance and commitment therapy (ACT) principles delivered by a clinical psychologist, which included online interaction between parents via a chatroom or messaging service as well as in the group sessions (Douma et al., 2021; Wakefield et al, 2016). Similarly, another study consisted of a website which contained 16 self-directed lessons based on CBT principles. The website contained the peer support component such that participants would interact via a ‘community garden’ (Duffecy et al., 2019). Lastly, one study provided traditional Chinese medicine alongside peer support for parents facilitated via a Facebook group (Wilford et al., 2020).

The remaining studies (*N* = 4) investigated internet peer support groups that did not form part of a wider intervention. Two studies investigated pre-existing internet peer-support groups, both of which were asynchronous discussion forums; one for parents living with a child with type 1 diabetes (Balkhi et al., 2014) and the other for parents diagnosed with cancer (Kosugi et al., 2021). One study examined an online peer support group for adoptive parents, which occurred weekly via video-conferencing software (Miller et al., 2019). Lastly, Martin et al. (2017)'s study consisted of an exclusive internet peer-support group developed by the researchers for parents of children with Neurofibromatosis.

The peer support components of the interventions investigated in the included studies varied in terms of whether the discussion between parents was controlled by a facilitator. The peer support in five studies was facilitated in a structured format – such that, in interventions involving video peer support sessions, these were facilitated by a clinical psychologist (Wakefield et al., 2016) or a trained parent facilitator (Miller et al., 2019), and in interventions involving online discussion forums, group discussions on pre- determined weekly topics were led by trained facilitators (McKeon et al., 2021; Sawyer et al., 2019; Wilkerson et al., 2019). Three interventions involved a mix of facilitated and unfacilitated peer support – Duffecy et al.'s (2019) intervention contained discussion questions that were posted by facilitators to encourage interaction but also unfacilitated, open interactive elements between parents. Martin et al.'s (2017) intervention also contained a facilitated, structured discussion forum as well as an open chat room. Douma et al.'s (2021) intervention was comprised of weekly facilitated group sessions and parents also had access to an unfacilitated chatroom where they could interact with each other. Out of the remaining seven studies, three contained online discussion websites that were not reported to be moderated or facilitated by anyone in the research team or other (Balkhi et al., 2014; Holtz et al., 2020; Kosugi et al., 2021) and four contained peer discussion forums whereby the discussions were not directly facilitated but the content was moderated by an online moderator (Boogerd et al., 2017; Linden et al., 2018; Love et al., 2016; Wilford et al., 2020). Additionally, the open discussion sections of Duffecy et al.'s (2019) and Martin et al.'s (2017) interventions were also monitored by a moderator. The purpose of moderating the discussion forums was the same across all studies, that is, to monitor the presence of abusive behaviour and to ensure it was a safe space for parents to share their feelings and experiences.

Three studies explicitly stated that parents' participation in the peer support elements of the interventions was anonymous (Douma et al., 2021; Love et al., 2016; Wilkerson et al., 2020). Participation was not anonymous in six studies (Duffecy et al., 2019; Holtz et al., 2020; Kosugi et al., 2021; McKeon et al., 2021; Miller et al., 2019; Wilford et al., 2020) and in six studies it was not reported whether parents' participation was anonymous or not (Balkhi et al., 2014; Boogerd et al., 2017; Linden et al., 2018; Martin et al., 2017; Sawyer et al., 2019; Wakefield et al., 2016).

Authors across all 15 studies typically commented on a general aim for parents accessing the peer support interventions to share information, concerns, and achievements and to form a mutually supportive network. Additional and more specific aims were reported in 12 studies, which can be found in Table 3.

Table 3.

Specific aims of interventions reported by included studies.

Author	Reported Aim of Intervention
Boogerd et al. (2017)	To increase parent knowledge, reduce parental stress, depression, and anxiety, provide social support and information.
Douma et al. (2021)	To decrease parental anxiety and depression and increase coping skills.

Duffecy et al. (2019)	To decrease parental depressive symptoms.
Holtz et al. (2020)	To increase knowledge surrounding type 1 diabetes, improve social support, perceptions of self-efficacy, and quality of life.
Linden et al. (2018)	To assist in decision-making, based on the woman's own documentation, to support self-care and to facilitate contact with peers.
Love et al. (2016)	To reduce disruptive child behaviour in children aged 2–12 years, improve parenting style, confidence and attributions, and improve parents' general adjustment (e.g., reducing stress).
Martini et al. (2017)	To increase perceptions of social support and self-efficacy for managing the child's disease and decrease depression and anxiety symptoms.
Miller et al. (2019)	To create a space in which participants could receive and reciprocate empathetic support and information.
Sawyer et al. (2019)	To prevent against the development of depressive symptoms during the postnatal period.
Wakefield et al. (2016)	Improve parents' quality of life and family functioning and decrease depression, anxiety, and fear of cancer recurrence.
Wilford et al. (2020)	To improve preventive health behaviours and quality of life.
Wilkerson et al. (2020).	To improve scores on parenting self-efficacy, overreactive or coercive parenting style, and lax parenting style variables.

Table 4.

Participant Characteristics.

Author	**Population**	**Total *N***	**Parent Age (mean)**	**Child Age (range)**	**Gender**	**Ethnicity**	**Location**
Balkhi et al. (2014)	Parents (mothers and fathers) living with a child diagnosed with Type 1 Diabetes.	102	40 years	2 – 23 years	Female = 94; Male = 8	Hispanic or Latino = 5%; Other = 89.2%	USA
Boogerd et al. (2017)	Parents (mothers and fathers) living with a child diagnosed with Type 1 Diabetes.	105	NR	Mean = 9 years	Female = 11; Male = 94	NR	The Netherlands
Douma et al. (2021)	Parents (mothers and fathers) living with a child diagnosed with a chronic illness.	67	42 years	NR	Female = 65; Male = 2	NR	The Netherlands
Duffecy et al. (2019)	Pregnant women.	24	30.5 years	NR	Female = 24	White = 72%, African American or Asian American = 8%, Multiracial =	USA

						8%, Latina = 4%	
Holtz et al. (2020)	Parents (mothers and fathers) of a child diagnosed with Type 1 Diabetes.	46	Range = 35 – 44 years	NR	Female = 41; Male = 5	White = 85%, NR = 15%	USA
Kosugi et al. (2021)	Cancer patients who are parents (mothers and fathers) of minor children (<18 years).	334	43.1 years	Mean = 10 years	Female = 267; Male = 67	NR	Japan
Linden et al. (2018)	Pregnant women (in first or early second trimester) diagnosed with Type 1 Diabetes.	158	30.8 years	NR	Female = 158	NR	Sweden
Love et al. (2016)	Parents (mothers and fathers) classified as disadvantaged and high-risk.	155	33 years	2 – 12 years	Female = 143; Male = 12	Hispanic = 65.81%; African American = 23.90%; NR = 10.29%	USA
Martin et al. (2017)	Parents (mothers and fathers) of one or more children aged 0 –	33	NR	2 – 23 years	Female = 29; Male = 4	NR	USA

	25 years with a diagnosis of Neurofibromatosis Type 1.						
McKeon et al. (2021)	Parents (mothers and fathers) of a child with a diagnosis of genetic epilepsy.	20	39.4 years	3 – 14 years	Female = 13; Male = 7	NR	Australia
Miller et al. (2019)	Adoptive parents (mothers and fathers).	27	39.11 years	NR	Female = 26; Male = 1	White non-Hispanic = 96.3%; Hispanic = 3.7%	USA
Sawyer et al. (2019)	New mothers.	133	31.65 years	2 – 6 months	Female = 133	NR	Australia
Wakefield et al. (2016)	Parents (mothers and fathers) of a child who has completed treatment for cancer.	45	42 years	2 – 16 years	Female = 39; Male = 6	NR	USA
Wilford et al. (2020)	Parents (mothers and fathers) of a child with a diagnosed brain tumour.	11	38 years	Mean = 7.8 years	Female = 9; Male = 2	Non-Hispanic white = 42%, Hispanic or Latino = 58%	USA

Wilkerson et al. (2020)	Parents (mothers and fathers) of children aged 10 – 16 years.	19	43.9 years	10 – 16 years	Female = 15; Male = 4	Non-Hispanic White = 15; African American = 2; Asian American = 2	USA

Table 5.

Study Characteristics and Key Results

Author	**Design**	**Comparison**	**Timepoints**	**Intervention (Exclusive peer support = E; Part of wider intervention = I)**	**Description of peer support (PS) element(s)**	**Psychological Outcome Measures**	**Key Findings**
Balkhi et al. (2014)	Cross-sectional questionnaire	None	One timepoint, no follow up (FU).	E – Type 1 Diabetes forum	Online discussion forum for parents of a child (or children) living with Type 1 Diabetes.	• Paediatric inventory for parents (PIP) • Hypoglycaemic fear scale (HFS-P)	• Forum membership (FM) significantly predicted hypoglycaemic fear behaviours (β = 0.23; *p* < .05) with a small effect size (ES), such that as FM increased by one standard deviation (SD), fear behaviours also increased by 0.23 of a SD. • FM significantly predicted parenting stress frequency (β = 0.28; *p* < .01) with a small ES, such that

							as FM increased by a SD, parenting stress frequency also increased by 0.28 of a SD.
Boogerd et al. (2017)	RCT	TAU control group	Baseline, 6 months (Time 1), 12 months FU.	I – Web-based portal ('Sugarsquare') that provides online parent-professional communication, peer support and diabetes information.	The web-portal contained a PS section, where participants interacted with each other via a chat application, a forum application or a blog application.	• Parenting stress index-short form (PSI).	• No significant differences in change in parenting stress over time between the two groups ($F_{3,101}$=.49, p =.49). • PSI scores at baseline was significantly correlated with the frequency of logins (ρ =.282, p =.03) and page views (ρ =.304, p =.02).
Douma et al. (2021)	RCT	Waitlist control group	Baseline, 6 months FU, 12 months FU.	I – Online psychosocial CBT/ACT group intervention (On Track Online) for parents. Six weekly virtual 90-minute sessions and a	PS formed part of the weekly sessions, as parents were grouped based on the age of their children	• Hospital Anxiety and Depression Scale (HADS) • The Illness Cognition Questionnaire for Parents (ICQ-P)	• Significant beneficial effects (p < .05) were found at 6- and 12-months FU for anxiety, depression and total HADS score; regression

				booster session after four months.	and interacted with each other. They also had access to a private, anonymous chatroom throughout the duration of the intervention.	- The Op Koers Questionnaire for Parents (OKQ-P) - The Cognitive Coping Strategies Scale Parent Form (CCSS-PF).	coefficients ranged from β = -.39 to β = -.51. The waitlist control group did not improve over time. - Significant effects (*p* < .05) on use of disease-related coping skills (OKQ-P, ICQ-P & CCSS-PF scores) were found at 6 months and 12 months FU. Regression coefficients ranged from β = .42 to β = .88. - Medium effect size (*d* = .59)
Duffecy et al. (2019)	RCT	Control condition (individual online prevention intervention)	Baseline, week 4 (Time 1), week 8 (Time 2), 4-weeks postpartum (FU 1), 6-weeks postpartum (FU 2)	I – 8-week online CBT postpartum depression prevention intervention	Participants in the PS condition had access to interactive components of the intervention's	- The Hamilton Depression Rating Scale (HDRS) - The Inventory of Depression and Anxiety	Depression scores on all measures showed a decline in the intervention group from baseline to FU 2 (mean differences ranging from -8.8 to -1.4).

					website, featuring an activity feed, discussion threads and individual and community flower gardens.	Symptoms (IDAS) • The Patient Health Questionnaire (PHQ-9)	
Holtz et al. (2020)	Single group repeated measures	None	Baseline, 8 weeks (post-intervention)	I – 'MyT1DHope' – a website for parents of children with Type 1 Diabetes.	A closed-Facebook discussion group.	• The multidimensional scale of perceived social support • Diabetes caregiver quality of life. • Diabetes self-efficacy.	• The caregivers' life satisfaction was significantly higher at post- ($M = 3.57$, $SD = .62$) compared to pre-test ($M = 3.38$, $SD = .58$); $t(45) = -2.80$, $p = .007$, $d = .31$). • There were no other significant differences.
Kosugi et al. (2021)	Cross sectional survey	None	One timepoint, no FU.	E – 'Cancer Parents' – online peer support forum for parents diagnosed with cancer.	Online discussion forum for parents living with cancer.	• Kessler Psychological Distress Scale (K6) • University of California, Los Angeles	The high loneliness group was significantly associated with being weekly active users of the online peer support group

						Loneliness Scale version 3 (UCLA-LS) - The abbreviated Lubben Social Network Scale (LSNS-6)	(odds ratio [OR] = 0.47, 95% CI = 0.26-0.85) as compared to not being weekly active users, smaller social network as indicated by lower scores of LSNS - 6 (OR = 0.78; 95% CI = 0.73-0.83), and higher levels of psychological distress, as reflected in the higher scores of K6 (OR = 1.16, 95% CI = 1.09-1.23)
Linden et al. (2018)	RCT	TAU control group	Baseline (early pregnancy), Time 2 (late pregnancy), Time 3 (2 months postpartum), Time 4 (6 months postpartum).	I – Web-based support with three components: 1) information pregnancy-/diabetes-related topics; 2) Self-care diary; 3) parent-parent discussion forum	Online discussion forum, moderated by the research group.	- Wellbeing questionnaire (W-BQ12). - Swedish Diabetes Empowerment Scale, short version (SWE-DES-10).	No significant differences observed.

Love et al. (2016)	Single group repeated measures	None	Baseline, 12 weeks post intervention, 6 months FU.	I – Triple P Online Community (TPOC) - an interactive online programme with social media and gaming features	Online social media platform developed by researchers – e.g., sharing programme work, 'starring' each other's posts. Parents create a virtual identity to maintain anonymity.	• CAPES Self-efficacy scale - Parents' self-efficacy in managing child emotional and behavioural problems. • Parent's Attributions for Child's Behaviour. • Depression Anxiety Stress Scales (DASS-21).	Significant time effects: • DASS-21 Stress (*F*(2,228) = 3.648, *p* = .028, η^2 = .03). • No significant effects on other measures.
Martin et al. (2017)	Single group repeated measures	None	Baseline, 8 weeks post-intervention, 3 month follow up	E – Internet support group (developed by the researchers) with two components: a chat room (open for one weekly, monitored 90-minute session) and a discussion forum (open all hours).	Online chat room and discussion forum.	• The PROMIS Depression Scale – Short Form. • The NF1 Parent Support Scale, adapted from the Diabetes Support Scale (DSS). • The Stanford Chronic Disease Self-Efficacy	• No significant effects for self-efficacy, anxiety or depression scores. • Mean perceived social support scores significantly increased from baseline-post intervention (*t* = 4.45, *p* = .0003).

						Scales (SCDSES)	• Perceptions of emotional (t = 3.99, p = .0008) and informational (t = 4.48, p = .0003) support increased.
McKeon et al. (2021)	Single group repeated measures	None	Baseline, 4 weeks post-intervention, 4 week follow up	I – 4-week physical activity programme in a private Facebook group.	Private Facebook discussion group, moderated by the facilitators.	• The Assessment of Quality of Life-6D scale (AQoL-6D) • The Kessler Psychological Distress Scale (K10) • The PTSD Checklist for DSM-5 (PCL-5) • The PTSD Checklist for DSM-5 • The Suicidal Ideation Attributes Scale (SIDAS)	• Significant time effect for K10 scores (F (2,11.71) = 8.72, p <0.01); BL-post: Hedge's g = .57 (-.12-1.25); BL-FU: Hedge's g = .79 (-.08-1.66). • Significant time effect for AQoL-6D scores F(2 , 25.55) = 6.05, p < 0.01); BL-post: Hedge's g = .06 (-.61-.73); BL-FU: Hedge's g = .59 (-.26 – 1.44). • No significant changes in PTSD scores. • Mean SIDAS scores reduced at FU.

Miller et al. (2019)	Single group pilot study	None	One timepoint (10 weeks after duration of support group)	E – 10-week virtual support group meetings, facilitated by trained facilitators.	Parents could communicate with each other in the virtual group via video conferencing and also via the discussion pane.	• Adapted version of the multidimensional scale of perceived social support • Measure of perceived empathy • Measure of perceived homophily	• Homophily was positively related to perceived empathy at the significant level of 0.01 (r = 0.575) and social support (r = 0.692, $p < .01$). • Multiple regression analysis revealed that only homophily significantly predicted perceived empathy (β = 0.574, $p < .05$).
Sawyer et al. (2019)	RCT	TAU control group	Baseline, 8 months, 12 months	I – 4-month group-based programme delivered via a mobile app, which had four components (chat room, timeline, resources, contacts/assistance).	Parents communicated with each other via the chat room and timeline in the mobile app.	• Parenting Sense of Competence Scale • The Parenting Stress Index (PSI) Competence subscale • Maternal Depressive Symptoms (EPDS)	• No significant differences between groups across timepoints.

Wakefield et al. (2016)	RCT	Waitlist control group	Baseline, 2 weeks, 6 months follow up	I – CASCAdE (Cope, Adapt, Survive: Life after CAncEr): a manualized group-based CBT programme consisting of 3 weekly 120-min online sessions.	Parents interacted with each other during the virtual sessions using video-conferencing software.	• Depression Anxiety Stress Scales (DASS-21) • Fear of Recurrence Questionnaire-Family Member • Quality of Life (QoL)-Family Caregiver Tool.	• No significant main effect of group or time on QoL, DASS-21 and family functioning scores. • Significant main effect of time on the fear of cancer recurrence ($F = 8.63$, $p < .01$, $\eta_p^2 = .22$), such that the fear of cancer recurrence was significantly lower at T2 ($F=37.57$, $p<.01$, $\eta_p^2 =.56$), and T3 ($F=7.03$, $p=.01$, $\eta_p^2 = .19$) for both groups.
Wilford et al. (2020)	Single group repeated measures	None	Baseline, one week post-intervention and three month follow up	I – 12-week programme consisting of 3 components: 1) a moderated private Facebook group; 2) weekly group traditional Chinese	Private Facebook discussion group.	• The Patient-Reported Outcome System (PROMIS).	Depression and anxiety T-scores decreased on average by 4.3 ± 2.4 and 4.6 ± 1.9 from T1–T3, respectively. Sleep disturbances decreased on

				medicine for parents and children; 3) weekly parent-only health behaviour education and yoga.			average by 4.6 ± 4.3, while emotional and information support increased by 2.9 ± 1.9 and 5.6 ± 1.9, respectively, from T1-T3.
Wilkerson et al. (2020)	Intervention mixed methods design	None	Preintervention and postintervention (6 weeks)	A parent management training intervention, consisting of a web-based orientation module, group introductions, three individualized parent management training modules, and three group discussion forums facilitated through a problem-based learning strategy.	Online discussion forum.	• Parenting Self Agency Measure (PSAM) – a measure of parenting self-efficacy.	• Statistically significant increase in PSAM scores from pre-test (M = 22.74, SD = 4.77) to post-test (M = 25.21, SD = 5.54) with a medium effect size (p = .03, pre-test–post-test Hedges's g = 0.54; $r_{\text{pretest,posttest}}$ = .62, p < .01).

Study Outcomes

A total of 10 out of the 15 included studies reported at least one significant finding. Out of the six RCTs that investigated the efficacy of online peer support interventions, only one study (Douma et al., 2021) reported significant positive effects of their online peer support intervention on parents' psychological outcomes compared with a waitlist control group. However, as reported above, Douma et al.'s (2021) study was assessed as having an overall high risk of bias thus it is necessary to be tentative when drawing conclusions about the relative positive impact of the authors' online peer support intervention compared to the control group. Despite utilising the gold standard RCT design, Douma et al., (2021) omitted details about the randomisation and outcome measurement processes to raise questions as to whether bias was introduced in these domains. Wakefield et al. (2016) reported a significant effect of time on one psychological outcome (parents' fear of cancer reoccurrence); however, this finding was present in both the intervention and the control group and therefore does not indicate a superior efficacy of the online peer support intervention. Out of the nine remaining non-RCT studies, eight reported at least one significant finding (Balkhi et al., 2014; Holtz et al., 2020; Kosugi et al., 2021; Love et al., 2016; Martin et al., 2017; McKeon et al., 2021; Miller et al., 2019; Wilkerson et al., 2020). However the review found that these studies were assessed as having high risk of bias in at least one category therefore the certainty of the overall evidence provided by the non-RCT designs must be interpreted with caution.

Key findings from each study are reported in Table 5. Effect sizes have been reported where available. For the purpose of synthesising the findings across a range of study methodology and measures, the findings have been grouped into the psychological outcome measure categories: mental health/stress/quality of life, loneliness/social support, coping with health conditions and parenting outcomes.

Parent Mental Health/Stress/Quality of Life

12 out of the 15 studies included at least one measure relating to mental health and/or stress or quality of life. Seven studies measured anxiety and/or depression (Douma et al., 2021; Duffecy et al., 2019; Love et al., 2016; Martin et al., 2017; Sawyer et al., 2019; Wakefield et al., 2016; Wilford et al 2020), four measured stress (Boogerd et al., 2017; Love et al., 2016; Sawyer et al., 2019; Wakefield et al., 2016), one measured general mental wellbeing (Linden et al., 2018), two measured psychological distress (Kosugi et al., 2021; McKeon et al., 2021), one measured symptoms of PTSD and suicidal ideation (McKeon et al., 2021) and two studies included self-report measures of quality of life (McKeon et al., 2021; Wakefield et al., 2016). Of these studies, there was notable heterogeneity in the measures used, which is detailed in Table 5. Four studies used the same outcome measure as one other study to investigate the same construct. Two studies (Boogerd et al., 2017; Sawyer et al., 2019) used the Parenting Stress Index (PSI; Abidin et al., 2006) and two studies (Love et al., 2016; Wakefield et al., 2016) used the Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) to measure stress. All the measures used to assess mental health/stress were validated self-report measures, completed by parent participants.

Three out of the seven studies measuring anxiety and/or depression levels reported a decrease in symptoms post online peer support interventions. Only one study reported statistically significant findings regarding parental anxiety and depression levels – Douma et al. (2021) reported significant ($p < .05$) effects of their peer support intervention were found at six- and

12-months follow up for symptoms of anxiety and depression and the total score on the Hospital Anxiety and Depression Scale (HADS; Bjelland et al., 2002). Regression coefficients ranged from $\beta = -.39$ (anxiety at 12-months vs. baseline) and $\beta = .51$ (HADS score at 6-months vs. baseline). Duffecy et al. (2019) did not test significance but reported a decrease in parents' depression scores from baseline to follow up (mean differences ranging from -8.8 to -1.4) and Wilford et al. (2020) reported a decrease in parents' depression and anxiety scores from baseline to follow up (mean differences ranging from 1.9 to 4.6). The remaining four studies did not report significant effects of the peer support intervention – Sawyer et al. (2019) reported no significant differences in maternal depression scores between baseline and follow up nor between the intervention and control group. Wakefield et al. (2016) also reported no significant main effect of group (i.e., waitlist vs. intervention) or time (i.e., baseline vs. post-intervention vs. follow- up) on parental depression or anxiety. Neither Love et al. (2019) nor Martin et al. (2017) reported effects on parents' scores on the DASS-21 (Lovibond & Lovibond, 1995) and the PROMIS Depression Scale (Cella et al., 2010), respectively.

Out of the four studies that measured stress, only Love et al. (2016) reported a significant decrease in parents' stress scores across timepoints with a small – medium effect size ($\eta^2 = .03$). The remaining three studies did not report significant effects of group (i.e., peer support vs. treatment-as-usual) or time on parents' stress (Balkhi et al., 2014; Boogerd et al., 2017; Sawyer et al., 2019).

Linden et al. (2018) observed no significant differences in women's general wellbeing scores following a peer support intervention designed for pregnant women compared with treatment-as-usual. In regards to psychological distress, McKeon et al. (2021) reported a significant effect for time in parents’ reported psychological distress at baseline to post-intervention (Hedge’s g = .57) and at baseline to four-week follow-up (Hedge’s g = .79) with medium-large effect sizes. Kosugi et al. (2021) demonstrated that higher psychological distress scores were associated with high levels of loneliness and less frequent use of the online peer support group. There were no significant differences in parents’ PTSD scores across timepoints in McKeon et al.’s (2021) study. They reported a mean reduction in suicidality scores, but a significance test was not reported.

McKeon et al. (2021) also reported a significant effect of time in regards to parents’ quality of life scores, which significantly increased from baseline to four weeks post-intervention (Hedge’s g = .06) and from baseline to four-weeks follow-up (Hedge’s g = .79) with medium-large effect sizes. In contrast, Wakefield et al. (2016) did not find a significant effect of group or time on parents’ quality of life scores.

Parental Loneliness/Social Support

Four studies in total measured outcomes relating to parents’ social support (Holtz et al., 2020; Kosugi et al., 2021; Martin et al., 2017; Miller et al., 2019) and one study measured parental loneliness (Kosugi et al., 2021). Two of the studies that assessed social support (Holtz et al., 2020; Miller et al., 2019) used the same outcome measure: the multidimensional scale of perceived social support (Zimet et al., 1990). Only one out of four studies found a significant increase in mean perceived social support scores post-online peer support intervention (Martin et al., 2017), the other study that tested significance did not find any differences in perceived social support pre- and post-intervention (Holtz et al., 2020). The remaining two studies found associations between social support and homophily and information seeking effectiveness (Miller et al., 2019) and between social support and online peer support group usage – such that, smaller social networks were associated with less frequent use of online peer support groups (Kosugi et al., 2021). Kosugi and colleagues (2021) were also the only researchers in the included studies who measured parents' levels of loneliness, and they found that the low loneliness group was significantly associated with being weekly active users of the online parent peer support group. In contrast the high loneliness group was significantly associated with using the online support group less frequently (less than once per week). This group was also significantly associated with having smaller social networks.

Parental Coping with Health Conditions

This category was chosen to group together the six studies that included measures relating specifically to health conditions, either in the context of caring for a child with a health condition (Balkhi et al., 2014; Douma et al., 2021; Holtz et al., 2020; Martin et al., 2017; Wakefield et al., 2016) or being a parent living with a health condition (Linden et al., 2018).

Two of the studies assessed parents' self-efficacy in relation to their child's health condition, that is, their confidence in their ability to perform health-related care tasks (Holtz et al., 2020; Martin et al., 2017). Neither study found significant effects on self-efficacy post- peer support intervention. Douma et al. (2021) investigated parents' cognitive coping skills in relation to their child's chronic health condition and found significant effects of the peer support intervention, with regression coefficients ranging from $\beta = .42$ to $\beta =.88$. The remaining two studies included measures specifically related to the population of interest. Wakefield et al. (2016) measured parents' fear about their child's cancer recurring and found a significant main effect of time ($\eta_p^2 = .22$) with a small-medium effect size, such that parents' fear was significantly lower at time 1 (η_p^2 =.56) and time 2 (η_p^2 = .19) compared to baseline. However, this was also the case in the waitlist control group and there were no significant between-group differences on this measure. Linden et al. (2018) measured self-empowerment in relation to pregnant women's own diabetes and found no significant effect of time, such that there was no significant difference in scores between women in the peer support intervention group and women in the treatment as usual group. There was also no significant effect of time observed between the four timepoints.

Parenting Outcomes

Three studies included outcomes that related to psychological aspects of parenting (Love et al., 2016; Sawyer et al., 2019; Wilkerson et al., 2020). All three studies included measures relating to parents' self-efficacy, however each study used different measurement tools. Wilkerson et al. (2020) found that parents' score on the Parenting Self-Agency Measure (Dumka et al., 1996) significantly increased following the intervention, indicating that parents increased their degree of belief in their parenting self-efficacy after engaging in the peer support intervention. Love et al. (2016) reported no significant effects on parents' scores on the CAPES Self Efficacy Scale (Morawska et al., 2014). Lastly, Sawyer et al. (2019) administered the Parenting Sense of Competence Scale (Johnston & Mash, 1989) and found that participants in the control group had higher scores on this measure at 12-months follow up compared to those in the intervention group. The authors postulated whether this can be attributed to control participants accessing more additional health services than mothers in the intervention group. Additionally, Love et al. (2016) administered the Parent's Attributions for Child's Behaviour Measure (Pidgeon & Sanders, 2002) to assess parents' negative attributional styles for the causes of children's misbehaviours but they did not find any significant effects.

Discussion

The current review aimed to update and expand on Niela-Vilén et al.'s (2014) integrative review and determine the impact of internet-based peer support interventions with a novel focus on parents' psychological outcomes in studies published since 2014. 15 studies containing 1279 participants were identified as meeting the inclusion criteria, of which six studies (*N* = 532 participants) were RCT evaluations. The formats of the online peer support groups and key findings relating to parent psychological outcomes will be reviewed in turn, followed by a discussion regarding the methodological quality of these studies, strengths and limitations of the review, future research and clinical implications.

Online Peer Support Group Formats

The current review demonstrated the variety and diversity of internet-based peer support for parents, which is in line with previous reviews (Niela-Vilén et al., 2014; Nieuwboer, et al., 2013). The internet-based peer support investigated in the included studies varied in terms of whether it was provided as a stand-alone intervention or as part of a wider parental intervention (e.g., group therapy sessions or interactive apps/websites), whether it was facilitated (i.e., the peer-peer discussion was initiated or controlled by a facilitator) or moderated (i.e., peer-peer discussions monitored for the presence of abusive behaviour). Similarly to Niela-Vilén et al.'s (2014) review, the majority of peer support communication occurred on asynchronous discussion boards (i.e., apps, chatrooms or social media pages). Only one study (Wakefield et al., 2016) consisted of video sessions via videoconferencing software.

Previous reviews (Niela-Vilén et al., 2014; Plantin & Daneback, 2009) have commented on one of the advantages of internet-based peer support being the opportunity to participate and engage in peer-peer discussion anonymously and, indeed, many of the studies included in their reviews had this feature. The authors discussed the feasibility this entails for parents to discuss sensitive topics at ease, without the fear of judgement or stigma that might be feared when interacting with an open personal identity (Diefenbeck et al., 2017). However, in the current review, only one study explicitly stated that the interactive peer support element of the intervention was anonymous. Parents enrolled in Love et al.'s (2016) peer support intervention communicated with each other through personal avatars in order to maintain anonymity. It was unclear in the other studies included in the review whether parents' interactions were anonymous or not, as most authors did not make any reference to this, however one can assume that Wakefield et al.'s (2016) peer support sessions were not anonymous due to these occurring via videoconferencing software. Given the benefits that have been found to be associated with anonymity in patient discussion forums (Dosani et al., 2014; Prescott et al., 2017; Strand et al., 2020; Tracy & Wallace, 2016), one could argue that it is an important detail that most of the studies included in the review have omitted in their reports.

Parents’ Psychological Outcomes

Out of the six RCT evaluations that investigated the efficacy of online peer support interventions, only one study with 67 participants (Douma et al., 2021) reported significant positive effects of their online peer support intervention on parents’ psychological outcomes compared with a waitlist control group. Anxiety and depression levels and disease-related coping skills were measured in their sample of parents of children with chronic illnesses. Their intervention was found to have a significant positive effect, of medium effect size (d = .59), on parents’ symptoms of anxiety, depression and disease-related coping skills (namely the relaxation positive thinking subscales) at 12-months follow-up in comparison to a waitlist control group. These findings indicate that the online intervention was effective in improving parents’ psychological outcomes, however it must be noted that the peer support element was part of a wider online intervention and so it cannot be concluded that it was the peer support element alone that contributed towards these positive findings. The intervention consisted of six weekly 90-minute group sessions, informed by CBT and ACT approaches, with a focus of teaching parents the use of adaptive disease-related coping skills. Following the first session, which was open for parents to get to know each other, the following sessions each focused on different themes, such as the chronic illness of the child and taking care of yourself. The sessions were delivered via a chatroom without the use of video and participants could also access a private, anonymous chatroom which could be accessed at any time throughout the duration of the intervention. The private chatroom, along with the interactive sections of the group sessions, formed the peer support element of the intervention. However, it remains unclear whether it was the interactive peer support that contributed to the positive effects on parents’ psychological outcomes, or the session content delivered by the course leaders or a combination of the two.

Wakefield et al. (2016) was another RCT that reported a significant effect of time on parents' psychological outcomes (specifically, parents' fear of cancer reoccurrence); however, this effect was not significant in comparison to the waitlist control group because control participants' fear of cancer reoccurrence also significantly reduced over time. Similarly to Douma et al.'s (2021) intervention, the peer support element in this study was incorporated into a broader online intervention which was developed to specifically target intra- and interpersonal psychological processes important to adaptation in the context of illness. However, participants did not have access to a private chatroom, therefore they only communicated with each other during the three intervention sessions. The authors cited the study's small sample size (*N* = 35) as one reason as to why the intervention did not yield significant effects on parents' psychological outcomes. They also commented that, due to the small number of sessions, parents may not have received an adequate 'dose' of the intervention in order to produce significant effects. Data that was collected as part of the intervention's feasibility and acceptability analysis showed that participants' rapport with each other steadily increased over the course of the sessions, as rated by the facilitators of the intervention (two clinical psychologists). Additionally, participants reported high level of satisfaction with the group support and group cohesion scores were found to be equivalent to those observed in face-to-face interventions (Lindgren et al., 2008). The authors commented that these findings point towards the power of sharing and normalisation of common emotional experiences with other parents, and that this type of peer support can be effectively translated to the online domain.

The remaining four RCTs showed no significant effects of online peer support interventions on parents' psychological outcomes, namely, parenting stress (Boogerd et al., 2017; Sawyer et al., 2019), depression (Duffecy et al., 2019; Sawyer et al., 2019), wellbeing and self-efficacy in diabetes management (Linden et al., 2018) and maternal self-competence (Sawyer et al., 2019). These studies all reported average attrition rates (ranging from 25 – 35%) (Gustavson et al., 2012), therefore other reasons may explain the lack of significant effects. One study cited their small sample size (*N* = 25) as the reason behind not finding any significant effects, especially as depression scores in the intervention group showed a decreasing trend from baseline to follow-up (Duffecy et al., 2019). Two studies reported low overall engagement with their interventions as potential reasons to explain the lack of significant findings – Sawyer et al. (2019) reported that the peer support chat element of the intervention app was the most frequently accessed by participants in comparison to the other elements. Participants made less use of app's text-based resources which were designed to provide support for depressive symptoms and guidance about how to solve common parenting problems. This indicates that, although the peer support element of the intervention appeared to be the most accessible and valuable element to participants, it was not effective in reducing depression symptoms. It is unclear whether a significant effect on depressive would have been produced if participants' use of the app's resources had been higher. Linden et al. (2018) reported that there was wide variability in participants' engagement with the online intervention and that over 20% had very low or no usage of the intervention. The researchers identified the main barrier to accessing the intervention as being the stressors of motherhood combined with diabetes management, that is, the problem the intervention was designed to assist with. It is unclear where researchers drew this information from or whether such factors were formally analysed, however these factors draw attention to what barriers online peer support interventions are designed to address (i.e., increased accessibility through the online format).

Out of the nine remaining non-RCT designs, eight studies reported at least one significant finding in relation to parents' psychological outcomes. Balkhi et al. (2014) found that online support group/forum engagement (i.e., membership or number of hours spent visiting online support group) was significantly positively related to parental stress levels and fear of hypoglycaemia in parents of children with diabetes, indicating that parents scoring higher on these measures are likely to spend more time visiting online support forums. Kosugi et al. (2021), on the other hand, found that less frequent use of the online peer support group was associated with higher levels of loneliness and that more frequent use of the online peer support group was associated with lower levels of loneliness in cancer patients with minor children. Two studies reported significant improvements in parents' quality of life pre- and post-intervention (Holtz et al., 2020; McKeon et al., 2021). Two studies measured outcomes relating to parenting, specifically, dysfunctional parenting behaviours. Love et al. (2016) reported a significant reduction in parents' use of dysfunctional parenting behaviours post-intervention, whilst Wilkerson et al. (2020) found no significant effects on this measure. Wilkerson et al. (2020) did however find that parents' scores on a parenting self-agency significant increased post-online peer support intervention. McKeon et al. (2021) and Love et al. (2016) reported significant improvements in parents' psychological distress and stress, respectively. Lastly, two studies investigated outcomes relating to parents' social support – Miller et al. (2019) found that parents' scores on a measure of homophily, which refers to the tendency of individuals to associate and bond with similar others, significantly predicted parents' perceived empathy in their pilot study of an online adoptive parent peer support group. Martin et al. (2017) found that parents' perceived social support and perceived emotional and information support significant increased pre- and post-intervention. Wilford et al. (2020) investigated a small sample (*N* = 11) of parents of paediatric brain tumour survivors and reported increases in parents' mental health and quality of life post-intervention, however significance testing was not performed.

Summary of findings

The findings from the non-RCT designs included in this review indicate the positive impact online peer support interventions can exert on a broad range of parental psychological outcomes across varying populations, including parents of children living with chronic health conditions (Balkhi et al., 2014; Holtz et al., 2020; Martin et al., 2017; McKeon et al., 2021, Wilford et al., 2020), parents identified as disadvantaged and high risk (Love et al., 2016) and parents living with cancer (Kosugi et al., 2021). Most of these studies employed a single group repeated measures design to assess the impact on parents' baseline scores after engaging in online peer support. Only one of the gold standard RCT designs, with the inclusion of a control group, found a significant effect of online peer support on parents' psychological outcomes.

It can be noted that most studies included in the review (nine studies in total) commented on parents' high levels of engagement, acceptability and satisfaction with online peer support interventions, which are not necessarily captured by psychological outcome measures. Four studies referenced participants' high levels of engagement with the online peer support interventions, in terms of the proportion of parents spending over an hour accessing online discussion forums per day (61.8%; Balkhi et al., 2014), the proportion of parents' peer support posts viewed by participants (93%; McKeon et al., 2021) and the proportion of parents (59%, 61% and 50%, respectively) actively posting in the peer support chat room (Duffecy et. Al., 2019; Martin et al., 2017; Sawyer et al., 2019). Furthermore, of the nine studies that sought anonymous qualitative feedback from participants, eight studies in total reported positive feedback – for example, 84.3% participants in Balkhi et al.'s (2014) study reported that "forum friendships were as good or better than in-person relationships", Holtz et al. (2020) reported that 82% participants' responses were positive, and that the appreciation of social support emerged as a dominant theme, Love et al. (2016) conducted a focus group with 50% (*N* = 78) of their total sample and reported that the overall feedback was very positive, with 61% explicitly referencing the social network interactive element of the intervention, Martin et al. (2017), McKeon et al. (2021) and Wakefield et al. (2016) reported that "most" participants commented on the emotional support received by connecting with similar others as the most helpful part of the intervention and Wilford et al. (2020) reported that 9 out of 11 responders rated their Facebook peer support group as "very valuable", with social support most frequently mentioned as the intervention's "most valuable" aspect. Therefore, even though the overall effectiveness of online peer support interventions as defined in this review remains inconclusive, as reported in Niela-Vilén et al.'s (2014) review, given the minimal positive conclusions drawn from RCT designs, the findings from the non-RCT studies and the broader qualitative data points towards online peer support as exerting some positive influence on parents' psychological outcomes (i.e., parental stress and quality of life) and as being deemed as acceptable and valuable by parent users.

Methodological Quality of Studies

Six studies utilised the gold-standard RCT design, however these were not without limitations. All studies had at least one category that was assessed as high or unclear risk of bias, with five studies assessed as having an unclear risk of bias in the randomisation process due to not providing sufficient information. Two RCT studies were assessed as having high risk of performance bias due to unblinded outcome measurement (Douma et al., 2021; Sawyer et al., 2019). Eysenbach (2004) highlights challenges that are faced when conducting internet based RCTs, including the risk that control groups become 'contaminated' by accessing a similar intervention elsewhere on the internet. None of the RCTs in the current review described any steps that were taken to limit control participants' ability to do this, however this would both be unethical and unfeasible. Having an active comparison group may limit control participants seeking alternative means of support, such as peer support on the internet (Karlsson & Bergmark, 2015). This methodology may also be beneficial to address the limitation that was noted in studies that investigated peer support as part of a wider online intervention regarding the inability to ascertain whether any observed effects are due to specific ingredients of the intervention – that is, whether the peer support element, or the therapy content, or a combination of multiple elements led to an improvement in parents' psychological outcomes. Comparing online interventions with and without an interactive peer support element could be important to better understand the mechanisms of change (Boogerd et al., 2017).

Many of the studies included in this review noted the challenge of recruiting fathers, despite many of the interventions being designed for both mothers and fathers (Balkhi et al., 2014; Boogerd et al., 2017; Douma et al., 2021; Holtz et al., 2020; Kosugi et al., 2021; Love et al., 2016; Martin et al., 2017; McKeon et al., 2021; Miller et al., 2019; Wakefield et al., 2016; Wilford et al., 2020; Wilkerson et al., 2020). Consequently, the total numbers of mothers who participated in the included studies was 1067 compared to just 212 fathers. The studies noted the limit this has on generalisability of any findings. Niela-Vilén et al. (2014) also noted the under-representation of fathers in parent peer support studies – the future challenge is to encourage fathers to participate in peer support groups, particularly noting that 57% men with mental health difficulties are parents (Royal College of Psychiatrists, 2015) and that over 10% new fathers experience depression compared to 4.8% men in the general population (Paulson & Bazemore, 2010). It is possible that fathers may benefit from connecting to others in similar situations. It is also possible that men are accessing online peer support groups, perhaps 'lurking' and not actively posting (Mo & Coulson, 2010), but are less likely to volunteer participation in research studies relating to peer support (Ryan et al., 2019). Therefore the over-representation of women might not give a true picture of peer support group users, however it remains important to encourage fathers' participation in such research studies to understand their experiences.

Strengths and Limitations of the Review

Strengths of this review include that it is the first to solely examine parents' psychological outcomes in relation to internet-based peer support. The inclusion of studies investigating a variety of parent groups, ranging from parents in general to parents of children with specific health conditions to adoptive parents, allowed for a wide range of interventions and outcomes to be reviewed. It included a relatively large sample size overall, studies conducted across a variety of countries and the rigorous search strategy identified studies highly relevant to the topic of internet-based parental peer support. However, the number of search terms related to the internet is high, thus it could be possible that there are some limitations concerning the search strategy resulting in some relevant articles being missed. The process of citation chaining should have limited the chance of this. A large proportion of articles had to be removed by hand because it was not feasible to develop a strategy that would identify studies that included parental psychological outcome measures in the context of online peer support.

A further strength of the review is the use of two reviewers to independently screen studies based on the inclusion and exclusion criteria.

Regarding limitations of the review, it was not possible to thoroughly compare and contrast the specific qualities of each study due to the multiple designs and methodologies used by the included studies. As such, there is a wide amount of heterogeneity in the peer support interventions as well as the outcome measures administered to parents. Future reviews may benefit from narrowing down the inclusion criteria to focus on a specific type of online peer support group interventions, such as open discussion forums on social media or more formalised, facilitated peer support. Using the chosen risk assessment tools, it was difficult to ascertain whether a study failed to address bias or whether the information was just not reported in the study. As suggested in Anderson and colleagues' (2018) review, future studies could consider looking at the risk of bias guidelines during write up to ensure all appropriate data are included and therefore enable a high-quality meta-analysis to be conducted.

Conclusion

The current review found that the effectiveness of internet-based peer support on parents' is not supported in the current literature due to the fact that five out of the six methodologically strong included studies showed no benefits of taking part in online support groups. The included studies that did demonstrate positive outcomes had methodologically weak pre-post designs. Despite the majority of RCTs included in this review failing to report significant effects of internet-based peer support on parents' psychological outcomes, which must be held in the context of the challenges of conducting randomised trials on internet-based interventions noted above (Eysenbach, 2004), findings from the non-randomised studies are a lot more promising with the majority reporting significant improvements in parents' psychological outcomes pre- and post-online peer support intervention. Furthermore, the qualitative feedback and high engagement reported in many of the included studies also point towards the usefulness and acceptability of internet-based peer support by parents. Given the current demand for such interventions and that they are currently being widely rolled-out, high-quality research using blind randomised controlled designs with diverse samples (i.e., inclusion of both mothers and fathers) urgently needs to be conducted.

Parental Loneliness, Psychological Wellbeing and Social Identification: The Impact of Online Support Groups

Abstract

Background: Parents, along with the general population, are facing increasing rates of loneliness and are turning to the internet for support and advice and to connect with other parents. To date there has been little quantitative evaluation of the existing online support groups (OSGs) that parents frequently visit, therefore it is unknown whether there exists any association between parents' psychological outcomes and their level of engagement with such groups. The current study therefore aimed to investigate the association between parents' engagement with OSGs and their levels of loneliness. A secondary aim was to investigate whether any relationship between online engagement and loneliness was moderated by the degree to which they identify with other group members (i.e., social identification) and their scores on measures of stress, depression and anxiety.

Methods: 180 parent participants (of children aged 5 – 18 years) completed a cross-sectional questionnaire. Correlation and multiple regression analyses were conducted to test the hypotheses.

Results: The current study did not find support for either hypothesis – there was no significant correlation between parent loneliness and OSG engagement. None of the aforementioned variables emerged as significant moderators, however parents' levels of stress, anxiety, and depression were significantly positively correlated with levels of loneliness.

Conclusion: The findings regarding parent loneliness and psychological wellbeing are in line with the literature in other populations. The lack of a significant correlation between parents' OSG use and loneliness is not in keeping with one previous study that has investigated similar variables. The absence of social identification being a significant moderator indicates that this construct may not be as relevant in this population. Methodological limitations and explanations regarding these findings are discussed.

Introduction

Loneliness

Being interconnected within society, well-embedded in communities, and surrounded by a wide range of social connections is associated with far-reaching positive effects on individuals' health and wellbeing (Berkman & Krishna, 2015; Perkins et al., 2015). In contrast, low social connectedness is increasingly recognised as a public health priority (Holt-Lunstad et al., 2017). Loneliness, which can be defined as the painful, subjective experience of an incongruence between actual social relationships and desired social relationships, either in quantity or quality (Perlman & Peplau, 1981), is one of the effects associated with low social connectedness (Hawkley & Cacioppo, 2010) that is impacting an increasing number of people. 5% of adults in the United Kingdom (UK) have reported feeling lonely 'often' or 'always', with an additional 16% reporting feeling lonely 'some of the time' (Office for National Statistics, 2018). The highest prevalence of loneliness has been observed in Eastern European countries, ranging from 7.7% to 12% in middle-aged adults and 18.7% to 24.2% in older adults (Surkalim et al., 2022), yet it has been noted that problematic levels of loneliness is a widespread issue across the globe.

Loneliness is increasingly regarded as an important societal and psychological challenge due to the detrimental consequences for affected individuals (Wigfield et al., 2022). Loneliness is consistently documented as exerting negative effects on individuals' physical and mental health (Ong et al., 2016; Ortiz-Ospina & Roser, 2020) – for example, it increases the risk of developing depression (Sjöberg et al., 2013; Smalbrugge et al., 2006; Stessman et al., 2014) and worsens depressive symptoms amongst individuals who are already depressed (Wang et al., 2018), is associated with elevated levels of anxiety (Wang et al., 2018) and can lead to problems with sleep (Griffin et al., 2020) and alcohol abuse (Bonin et al., 2000; Stickley et al., 2014). Speaking to the significance of these problems, a meta-analysis concluded that loneliness was more predictive of mortality than poor diet, lack of exercise, and alcohol consumption, and as harmful as smoking (Holt-Lunstad et al., 2010). Despite most of the research into loneliness focusing on older adults, who typically experience increased rates of social isolation (Nicholson, 2012), there is a growing recognition of loneliness exerting an increasing impact over younger age groups (Loades et al., 2020).

A recent survey of 46,054 individuals living across 237 countries reported that 40% of those aged 16 – 24 years reported feeling lonely, compared to 27% of adults over 75 years (Barreto et al., 2021). Comparable rates were previously reported in a Danish study of 33,285 individuals aged 16 – 102 years, whereby the highest levels of moderate and severe loneliness were seen in adolescence and emerging adulthood, in addition to old age (Lasgaard et al., 2016). With loneliness itself often being cited as an epidemic (Jeste et al., 2020), there have been heighted concerns about its effects during the COVID-19 pandemic. Lockdowns and 'stay-at-home' orders saw social interaction and social support drastically decrease worldwide and, consequently, many individuals across the lifespan experienced elevated loneliness for the first time (Groarke et al., 2020). Studies have reported a significant increase in self-reported loneliness after lockdown measures were introduced – for example, Bu et al. (2020) found that, over the first six weeks of lockdown, loneliness levels increased in the highest loneliness group, decreased in the lowest loneliness group and stayed stable across the two middle groups. They also identified that being of a younger age was a significant risk factor for increased levels of loneliness during this time period, contrary to what one might assume given the large amount of research into loneliness in older populations. Lee et al.

(2020) also reported significant increases in loneliness from pre-pandemic levels to April/May 2020 (during lockdown measures) in a sample of 564 young adults. They noted that this was particularly prominent in those who had reported elevated levels of social support pre-pandemic, indicating that social support can be a protective factor against loneliness.

One population where there has been little investigation into the experience of loneliness is parents. Parents would have been included in the broader samples aforementioned, however specific investigation of this population is warranted due to the detrimental mental health outcomes associated with loneliness and the well-documented impact of parents' wellbeing on their children's outcomes (Kamis, 2021; Luoma et al., 2019; Panula et al., 2020). Recognising that loneliness is a risk factor for poorer psychological wellbeing, and that an increasing number of individuals in younger generations are experiencing loneliness (Groarke et al., 2020), it is important for further research to be conducted in this field in order to establish and direct appropriate strategies and parental support. At present there is a dearth of rigorous population-wide studies that have investigated prevalence rates of parental loneliness. Action for Children (2017) surveyed over 2000 parents and stated that around one third reported experiencing loneliness 'often' or 'always', however it can be noted that such findings may be impacted by sampling bias. El-Osta et al. (2021) reported that 58.9% of their sample of parents of school-aged children in the UK ($N = 1214$) reported feeling lonely 'often' or 'most of the time' during the first 100 days of the COVID-19 lockdown in an online cross-sectional survey. The authors commented on the importance of looking to the needs of this population both during the pandemic and beyond due to the short- and longer-term impact parents' psychological wellbeing exerts on children's outcomes.

Nowland and colleagues (2021) recently conducted a scoping review of 133 studies that examined parents' experiences of loneliness. The authors noted a lack of conceptual studies to identify key underlying mechanisms associated with parental loneliness, as well as few longitudinal studies to establish how loneliness changes over the course of parenthood. It was highlighted that the included studies reflected findings in the wider literature regarding the association between loneliness and increased depression, anxiety and stress levels (Kruse et al., 2014; Luthar & Ciciolla, 2015; Oakley et al., 1998). A small number of studies documented the association between parents' loneliness and adverse child outcomes, such as increased levels of internalising problems (Al-Yagon, 2008; Stednitz & Epkins, 2006). The authors also commented that, whilst some studies pointed towards groups of parents who might be at an increased risk of loneliness (i.e., parents of children with chronic illnesses, parents from ethnic minority backgrounds and single parents), the evidence is inconclusive due to a lack of comparison studies.

Finally, Nowland et al. (2021) reviewed intervention studies within this population. Whilst the included intervention studies were not explicitly designed to reduce parents' loneliness, key mechanisms were identified in studies that reported a reduction of loneliness levels. These included the importance of forming social connections via parental peer support (defined as communities of common interest where individuals give and receive help, ask questions and share experiences [Dale et al.,2008]) (Dennis et al., 2009; Shorey et al., 2019), aligning with wider literature that demonstrates peer support as providing important feelings of validation, normalisation and reassurance (Suresh et al., 2021). The World Health Organisation proposed peer support as a crucial intervention to address loneliness and improve the health of older people around the world (Fakoya et al., 2020; Gardiner et al., 2018, WHO, 2019) because such interventions have been reported to significantly reduce loneliness in this population, as well as achieve other positive psychological outcomes such as reducing depressive symptoms and improving overall life satisfaction (Lai et al., 2020).

The effectiveness of peer support interventions exerting a positive impact on individuals' loneliness and other psychological outcomes can be understood in terms of the "social cure" (Haslam et al., 2019), which is constituted through group memberships that provide individuals with meaning, support and agency (Jetten et al., 2017). It is the way in which such social identity processes are key to understanding health and wellbeing that underpins the social identity approach to health (Haslam et al., 2008).

The Social Identity Approach to Health

The social identity approach to health (Haslam et al., 2008; Jetten et al., 2017) is comprised of two related theories: social identity theory (Tajfel & Turner, 1979) and self-categorisation theory (Turner & Reynolds, 1987), and fundamentally holds the premise that the way a person thinks and feels about the self is derived from their group memberships (Levy et al., 2019). The framework accounts for the ways in which social connectedness enhances health, whereby group memberships provide an important basis for self-understanding and self-definition. A group identity is formed through: (1) categorisation: an awareness of similarities that collectively connect group members, and (2) identification: placing positive value on the importance of belonging to a group. Such group identities can enhance individuals' commonality with other group members and pave the way for more positive social relationships (Lincoln & Chae, 2012).

Research informed by the social identity approach to health investigated a manualised group intervention, Groups4Health (G4H), designed to reduce loneliness by enabling individuals to develop group memberships and associated social identities. The intervention aims to equip individuals the knowledge and skills they need to effectively manage their own social group memberships and the identities that underpin them, as well as the opportunity to form new group memberships with the other individuals in the intervention. Two phases of clinical trials were found to significantly reduce participants' loneliness, stress and depression compared to (a) a non-randomised, matched no-treatment control group (Haslam et al., 2016) and (b) a randomised control group of individuals seeking help for loneliness (Haslam et al., 2019). A third phase compared G4H to a randomised active control group of individuals receiving group-based CBT for depression (Cruwys et al., 2022). Loneliness was found to improve significantly in both groups and G4H showed a slight advantage over the CBT group at 12-months follow up. Both groups showed comparable significant effects on participants' depression scores. Crucially, participants' social identification with the G4H group, defined as the subjective sense of belonging to a group and of commonality with other in-group members (Haslam et al., 2022), was found to be a significant independent predictor of participants' psychological wellbeing. This indicates that participants' social identification with other group members was a significant mechanism of change in the intervention (Haslam et al., 2016)

Sani et al. (2012) also demonstrated the critical curative mechanism of social identification in line with the social identity theoretical model. Across two studies, they found that participants' social identification with group members (family members and an army unit) was a better predictor of psychological wellbeing than their level of social contact. Their findings indicated that the effects of social identification on mental health cannot be explained by the amount of social contact. Instead, social identification was concluded to play a central role in the process leading from social integration to health by (1) affording a sense of structure and meaning, and (2) constituting a precondition for positive social relationships based on trust, support, and respect, which in turn paved the way for positive mental states and mental health. These findings are in line with the conclusions drawn from Postmes et al.'s (2019) meta-analysis of 76 studies that examined the relationship between social identification and depression. Their results indicated a small to moderate negative relationship between the two variables, such that higher levels of social identification were associated with lower levels of depression. However, the authors noted that this relationship was highly variable across the heterogeneous pool of included studies – of particular note is the finding that studies that focused on identification with interactive groups, which included therapy and peer support groups, had larger effect sizes than studies that focused on pre-existing social categories (e.g., Jetten et al., 2015). This indicates that social identification plays a particularly important role in the exchange of social support.

It is theorised that social identification forms a basis for the provision and receipt of social support, such that it is more forthcoming and ultimately more beneficial when it is provided by fellow ingroup members with whom individuals strongly identify with. Studies have demonstrated that the extent to which individuals identify with the group in a peer support intervention context, that is whether they see themselves as not just "I" and "me" but "we" and "us", has an important impact on psychological outcomes. When individuals are assessed as identifying strongly with their group (and hence having internalised the group membership as an important aspect of their self and their identity), group membership has consistently been found to be an important predictor of psychological wellbeing, including loneliness, depression, self-esteem and Post-Traumatic Stress Disorder (PTSD) (Cruwys et al., 2014;

Frenzel et al., 2022; Greenaway et al., 2016; Häusser et al., 2020; Muldoon et al., 2021), as well as facilitating wellbeing and coping when individuals are faced with new life challenges (Iyer et al., 2009).

To date, the social identity approach to health has seldom been studied in relation to parents. This could be regarded as somewhat surprising given the change in adults' social identity during the transition to parenthood. Only one study could be identified which investigated this construct in relation to parents. Specifically, Zagefka et al. (2021) recently investigated whether having a dual social identity as a mother and an employee was associated with life satisfaction and self-esteem. They found that identifying with both work and parenthood social identities had a positive impact on wellbeing in their sample of 208 mothers. Perceived conflict between these two social group identities was found to be negatively associated with psychological wellbeing. These findings are in line with the central tenet of the social identity approach that having strong social identification is good for individuals' health, however they also suggest that conflict between these identities can exert a negative impact on parental wellbeing.

It is evident that the social identity approach to health can be a useful way of understanding how social connectedness, either through existing social group memberships or more formalised social interventions such as peer support groups, exert a positive influence on individuals' psychological health outcomes. The social identity approach to health providing support for the implementation of social interventions comes at a time when individuals are experiencing increasing rates of social isolation and loneliness, as aforementioned (e.g., Groarke et al., 2020), thus increasing the opportunities of social group memberships via accessible means, such as the internet, seems to be of paramount importance (Merchant et al., 2022).

The internet is a forum for which peer support can be provided in an accessible way to individuals, without being limited by geographical or practical constraints. Increasingly relied upon during periods of social distancing, such as during the COVID-19 pandemic, the internet has more than ever gained recognition as being a valuable platform for the delivery of health interventions (Bojdani et al., 2020). Driven by this development, Su et al. (2022) sought to explore the utility of online social-identity based groups – specifically, they investigated whether previous findings of social group identification predicting positive health outcomes could be replicated in an online peer support group for individuals with type 2 diabetes. In their comparison of two online groups delivered to 25 participants over the course of three months, they found that higher social identification in terms of group membership significantly predicted higher peer support behaviour (relating to informational and emotional support seeking), task completion (in relation to diabetes self-management) and health outcomes (namely glucose levels and self-efficacy). This study firstly shows that social identification plays an important role in the effectiveness of peer support interventions, and secondly that social identification processes can be influential in online settings as well as face-to-face interactions.

Given the current trend in shifting clinical work and health interventions into the online world (Andersson et al., 2020), it remains important to examine what else is known about digital offerings of peer support and social connectedness. Additionally, due to the aforementioned loneliness rates experienced by parents (El-Osta et al., 2021) and the known stress and mental health-related problems in this population (Royal College of Psychiatrists, 2015), online social communities for parents could be an important avenue to explore.

Online Social Communities for Parents

Parents may be targets for such online social communities partly due to their high internet usage. In a 2021 national survey of over 700 parents (National Advisory Council for Online Safety, 2021), 84% identified as being "experienced internet users" having been online for "many years", with a further 11% reporting that they had been internet users for "a few years". Additionally, 91% of respondents go online at least daily, with 41% doing this several times per day and 16% being online almost all the time. It has previously been indicated that parents are leading internet users, with more than 70% of parents in the United States going online compared with 53% of nonparents (Allen & Rainie, 2002). More recently, a higher proportion of married-parent and single-parent households with children under 18 years were found to be connected to broadband, 84% and 66% respectively, compared to 55% in households without children (National Telecommunications and Information Administration, 2011). Furthermore, given the opportunities to connect with others remotely, it is not surprising that parents' internet use, particularly their use of social media, increased during the COVID-19 pandemic (Drouin et al., 2020). With this surge in parents' presence in the online world comes an increasing amount of research into the use of social media, and other social forums, for parent-to-parent peer support.

Numerous qualitive and quantitative studies have investigated parents' experiences of using the internet to seek information and support regarding their child's health and wellbeing, as well as their own parenting (Meyers et al., 2020; Moon et al., 2019; Pehora et al., 2015;

Plantin & Daneback, 2009; Pretorius et al., 2019). It is evident that many diverse parenting communities have been established online over recent years, both formally and informally, which parents access for various reasons including anonymity and immediate affirmation and support (Yamashita et al., 2022). These online support groups (OSGs) can broadly be defined as "any virtual social space where people come together to get and give information or support, to learn, or to find company" (Preece et al., 2003) and can take various forms ranging from bulletin boards, blogs, email threads, discussion forums and social media webpages. Such groups can be more formal groups or websites driven by professionals, however, perhaps more common are user-driven online discussion fora, comprised of web-based discussion in which the content is solely created by the public using the site (Saha et al., 2019). Yamashita et al. (2022) reviewed 21 studies that had investigated OSGs for mothers with young children. Although the lack of experimental designs and thus the opportunity to evaluate effectiveness in comparison to other forms of support was noted, several positive outcomes were associated with engagement with these groups, including increased perceived social support (Holtz et al., 2015), feelings of empowerment (O'Connor & Madge, 2004), self-esteem (Nolan et al., 2015), and reduced stress (McDaniel et al., 2012).

Similar positive psychological outcomes have been reported in other parental populations, such as parents of children with disabilities (Shilling et al., 2013) and parents of children with autism spectrum disorder (Clifford & Minnes, 2013). Additionally, Shilling et al. (2013) identified four themes relating to engagement with OSGs: shared social identity, learning from the experiences of others, personal growth, and supporting others. Another qualitative study investigated the use of a popular OSG (Mumsnet) by parents of children with mental health needs. Their thematic analysis suggested that these parents predominantly use Mumsnet to offer and receive emotional support and to suggest general advice, techniques, and resources that could be applied outside of help from professional services (Croucher et al., 2020). Furthermore, the authors noted that this particular parent population may be more likely to turn to the internet for support and advice due to the increasing difficulty accessing Child and Adolescent Mental Health Services (CAMHS) as a result of high acceptance thresholds and long waiting times (Crenna-Jennings & Hutchinson, 2020) during which parents report not being referred to or directed towards appropriate forms of support (YoungMinds, 2019).

As a result of the literature published to date, it can be argued that these virtual communities provide a valuable platform for parents to offer and receive emotional support from others (Croucher et al., 2020) and, with the provision of specific webpages or groups that cater to specific subgroups (i.e., parents of children with chronic health conditions [Shilling et al., 2013] or mental health needs [Prescott et al., 2020]), parents are able to communicate to others in similar situations to them and form shared social group identities, as described previously (O'Connor & Langer, 2019).

Despite the growing amount of research in this field, gaps in the evidence base relating to the use of OSGs and their potential benefits for parents remain. Firstly, in their review of 38 studies of online peer support for parents Niela-Vilén et al. (2014) highlighted that very few studies considered factors that moderated the relationship between the use of OSGs and parent outcomes, and as such it remains unclear as to what might be driving this relationship – for example, is it the shared group identity that contributes towards positive outcomes, or is it more related to the process of picking up coping strategies or positive behaviours that leads to a positive change in parental psychological outcomes. Furthermore, Niela-Vilén et al. (2014) commented that the examination of potential moderators paid little attention to the research literature on psychological theories and factors that could be of particular relevance such as social identification theory (Jetten et al., 2017) and the mental health needs of the user. It is evident that further research with the inclusion of psychological outcomes is needed to better understand the relationship between OSGs and parent outcomes – one outcome being loneliness which has thus far been neglected in the literature regarding OSGs for parents despite the high prevalence of loneliness since the COVID-19 pandemic (El-Osta et al., 2021).

Summary of evidence so far

In summary, the current evidence suggests that OSGs can provide a valuable platform for parents to be able to connect with others in similar situations, share and seek emotional and informational support and have access to normalising and validating information. The research investigating the association between these online spaces and parents' outcomes have mainly been limited to qualitative designs. As reported in the systematic review, studies that have investigated the effectiveness of OSGs for parents have largely investigated interventions that have been created by the researchers, rather than support groups that parents are already accessing. The current evidence also suggests that social identification, a construct not previously extensively examined in parents, might be a mechanism which contributes to positive outcomes associated with parental OSG engagement.

Novel contribution to the literature

This study will add to the literature in a novel way because no previous research has investigated the social identity approach to health (Haslam et al. 2009; Jetten et al. 2012) with regards to parental OSGs or loneliness, despite previous studies reporting a positive relationship between social identification and psychological outcomes (including depression, stress and anxiety) following peer support interventions (Su et al., 2022) and the importance of the internet as a source of support (Yamashita et al., 2022). The focus on parental loneliness is also important given the wide and intergenerational impacts associated with the pervasive and negative psychosocial condition. Many previous studies examining parents' use of OSGs have involved parents of infants and pre-school-aged children (Niela-Vilén et al., 2014; Yamashita et al., 2022), whereas the current study focuses on parents of children aged 5 – 18 years due to the additional challenges and stressors parents face as children move throughout childhood and adolescence (Frigerio et al., 2004). Establishing an enhanced understanding of the positive (or negative) effects on loneliness of parental engagement with online support fora has important implications for understanding potential maintaining mechanisms of chronic loneliness and psychological wellbeing as well as treatment interventions.

The Current Study

The current study sought to investigate the relationship between parents' engagement with OSGs and their self-reported levels of loneliness. Additionally, the study aimed to examine whether parents' scores on measures of social identification, depression, stress and anxiety moderated this relationship. Parents of children aged between 5 – 18 years were recruited to complete a cross-sectional questionnaire measuring these variables. This age range was selected because high levels of loneliness have recently been reported in parents of school aged children (El-Osta et al., 2021) and because of the challenges and stressors that parents typically face during this time period (Frigerio et al., 2004) which may increase their likelihood of visiting OSGs. Specific aims and hypotheses are reported below.

Primary Aim:

The primary aim of the current study is to establish whether parental engagement with OSGs is associated with parent loneliness.

Hypothesis:

It is hypothesised that there will be an association between engagement with OSGs and loneliness. Specifically, there will be a negative correlation between (i) the number of minutes parents spend using OSGs on an average day and their levels of loneliness and (ii) between the number of posts parents write on OSGs per average week and their levels of loneliness.

Secondary Aim:

A secondary aim of the study is to investigate whether any relationship between OSGs and loneliness is moderated by (a) social identification and (b) parental stress, anxiety and depression.

Hypothesis:

It is hypothesised that the relationship between engagement with OSGs and loneliness will be moderated by scores on the parental social identification, stress, depression and anxiety self-report measures.

Method

The current study is written in accordance with the STROBE guidelines for the reporting of observational studies (von Elm et al., 2007).

Study Design

This study had a cross-sectional, correlational design. Participants completed a single questionnaire that contained questions measuring the predictor variable: OSG use, and the outcome variable: parental loneliness. Questions also measured the moderator variables: depression, anxiety and stress and social identification, along with demographic information.

Ethical Approval

Consultation from the Royal Holloway University of London (RHUL) Research Ethics Committee identified no ethical issues, therefore ethical approval was granted on 30/06/2021 (application ID 2655; Appendix 1).

Participants

Sample

The population of interest was a community sample of parents (both mothers and fathers) of children aged 5 – 18 years (at least one child in this age range). A non-clinical sample of parents was selected to increase generalisability of any findings. However, as discussed earlier, numerous parents of children identified as struggling (i.e., with mental health difficulties) are accessing the internet as a form of support. Therefore, although an a-priori hypothesis has not been formulated in relation to this, it was felt to be important in the current study to appeal to these parents via the recruitment strategy in order to consider the proportion of parents self-identifying as being a parent of a child who is currently struggling and their use of online support groups, as per Croucher et al.'s (2020) findings.

Power Analysis

A power analysis was conducted to calculate the number of participants required for the current study. There exists limited previous research investigating similar variables in the population of interest, however a study that investigated parental outcomes in relation to use of online diabetes forums demonstrated effect sizes ranging from .23 and .28 (Balkhi et al., 2014) and Haslam et al. (2017) demonstrated effect sizes ranging from .02 – .68 in their study of factors relating to parents' use of social media for parenting support. Based on this, an effect size of .085 was chosen within these ranges. G*Power (Erdfelder et al., 1996) was used and a sample size was calculated based on hypothesis 2 as the main hypothesis and a planned multiple regression analysis with five variables predicting parental loneliness. This a priori power analysis for a multiple regression analysis, with five predictors and an effect size of $F^2 = .085$, $\propto = .05$ and power = .8, requires N = 117. Therefore, for the current study to be powered adequately for the main effect, 117 participants were required.

Inclusion/Exclusion Criteria

In order to increase the likelihood of recruiting the required number of participants for sufficient power, there was no other inclusion or exclusion criteria aside from participants' needing internet access in order to complete the questionnaire.

Recruitment

Participants were recruited via opportunistic sampling from September 2021 – March 2022. Consistent with previous research (Kosugi et al., 2021; Parsons et al., 2009), the recruitment strategy involved advertising through local newsletters, schools, sports clubs and groups and social media pages in order to reach as many parents as possible. The study was also advertised on OSGs, such as Mumsnet, Rollercoaster Parenting and local Facebook groups for parents. All the study adverts contained the study poster, researcher contact details and the link to the questionnaire (Appendix 2).

Measures

Demographic Information

Participants completed questions relating to their demographic characteristics (Appendix 3). Participants were asked about their age, gender, ethnicity, marital status and parenting status. They also completed questions relating to their children, including the number of children and their children's age. Participants were also asked whether they identified any of their children as struggling (i.e., anxiety, school difficulties, friendship problems etc.) at the time of completing the questionnaire. Participants completed multiple choice questions in relation to the type of difficulties their child(ren) were experiencing, as well as the support that they were either waiting or currently receiving (if applicable). Parents were asked an additional question regarding their engagement with other types of parenting support. The purpose of including these questions was to gain an understanding of the characteristics associated with parents accessing OSGs.

Parental Engagement with Online Support Groups

A series of questions were designed by the researchers (Appendix 4) to capture the frequency and type of parents' engagement with OSGs. These questions were adapted from previous studies (Mo & Coulson, 2013) and focused primarily on two levels of online engagement: firstly, how much time parents typically spent on OSGs in an average week (i.e., "When you visit or have visited the internet support group/forum, how much time do you typically spend on it?") and secondly, how many posts parents typically write on OSGs in an average week (i.e., "How many posts, on average, do you write in the internet support group/forum on a typical week?").

Loneliness

Loneliness was measured using the UCLA Loneliness Scale Version 3 (Russell, 1996) (Appendix 5). The 20-item self-report scale is designed to measure individual's subjective feelings of loneliness. Participants rate each item on a scale from 1 (Never) to 4 (Often). Higher scores indicate greater degrees of loneliness (minimum score = 20, maximum score = 80). This measure was chosen because it is widely used as a measure of loneliness in adult samples and has excellent psychometric properties; it is indicated to be highly reliable, both in terms of internal consistency (coefficient alpha ranging from .89 to .94) and test-retest reliability over a one-year period ($r = .73$) (Russell, 1996). Convergent validity for the scale has been indicated by significant correlations at the $p < .001$ level with other measures of loneliness.

Stress

Parental stress was measured using the Parental Stress Scale (PSS; Berry & Jones, 1995) (Appendix 6). The scale contains 18 items representing positive themes of parenthood and negative components. Respondents are asked to agree or disagree with items in terms of their typical relationship with their child and to rate each item on a five-point scale, ranging from strongly disagree to strongly agree. The scale is intended to be used for the assessment of stress in parents of children both with and without clinical mental health difficulties. The scale has demonstrated satisfactory internal reliability (.83) and test-retest reliability over a six-week period (Berry & Jones, 1995). The scale has demonstrated satisfactory convergent validity between the PSS and family functioning, parental anxiety, and depression (Zelman & Ferro, 2018). It has also been found to demonstrate good concurrent validity, as high correlations between the PSS and the Perceived Stress Scale were reported in a US sample (Berry & Jones, 1995).

Anxiety Symptoms

Parents' anxiety symptoms were measured by the Generalised Anxiety Disorder Assessment (GAD-7; Spitzer et al., 2006) a seven-item self-report measure of anxiety in adults (Appendix 7). Higher scores indicate higher levels of anxiety. The scale is reported to have good internal consistency (Cronbach's alpha of .89) and construct validity (Löwe et al., 2008)

Depressive Symptoms

Parents' depressive symptoms were measured using the Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002) (Appendix 8). The widely used 9-item self-report measure of depression in adults has high internal consistency (Cronbach's alpha of .89) and high test-retest reliability (*r* = .84) (Kroenke & Spitzer, 2002). Higher scores indicate higher levels of depressive symptoms.

Social Identification

Social identification, defined as the positive emotional valuation of the relationship between the self and a particular group (Postmes et al., 2013), was measured by the Four-Item measure of Social Identification (FISI; Postmes et al., 2013) (Appendix 9). This measure has been used in previous studies to measure participants' sense of connectedness with their health support group (Haslam et al., 2016). Four items ("I identify with [group]", "I feel committed to [group], "I am glad to be in [group]" and "Being in [group] is an important part of how I see myself") are rated on a scale from 1 (strongly disagree) to 7 (strongly agree). This measure was adapted to include the words "internet support group/forum". The measure is indicated to have good internal reliability (. 77) (Postmes et al., 2013).

Procedure

Questionnaire Completion

Prior to the questionnaire being published for participants, the questionnaire was piloted by two fellow trainee clinical psychologists to ensure that the survey was working appropriately, was not too long and to gain qualitative feedback (regarding any improvements that could be made). As a result, some minor practical amendments were made within Qualtrics for ease of use, such as displaying a progress bar.

The questionnaire was completed online using Qualtrics. Participants accessed the questionnaire either through a direct link or via a QR code. Participants were first presented an introductory page containing a link to download the full participant information sheet (Appendix 10). The participant information sheet summarised the aims, process, risks and benefits of participation, confidentiality, data storage processes, ethical approval, and the researchers' contact details (Appendix 11). Participants then provided information consent on an online consent form, which was stored securely electronically (Appendix 12).

Participants were then guided through the sections of the questionnaire, which followed the order of demographic information, online support group engagement, loneliness measure, stress measure, anxiety measure, depression measure and finally the social identification measure. In order to minimise missing data, the 'force response' option was in place which meant that participants were prompted to answer all questions before moving onto the next section. The questionnaire was coded such that participants who responded either "several days", "more than half the days" or "nearly every day" to question nine on the PHQ-9 ("Thoughts that you would be better off dead, or of hurting yourself in some way?") were displayed a screen containing information about seeking support for mental health concerns and crisis contact numbers (Appendix 13).

At the end of the questionnaire, a screen was displayed thanking participants for their time and an option to submit their email addresses in order to be entered into an anonymous prize draw for a £50 Amazon voucher. The winner of the prize draw was subsequently selected through a random number generator.

Statistical Methods

Missing Data

Out of 197 eligible participants, 8% of cases (N = 17) contained missing data, whereby the questionnaire had been terminated early before all sections had been completed. Given the reason for the missing data was deemed to be unrelated to the outcome of interest (parental loneliness) and because the remaining sample size was greater than the required sample size calculated by the power analysis, it was considered to be acceptable to remove these cases and conduct a complete case analysis with the data from the remaining 180 cases (Hughes et al., 2019).

Quantitative Analysis

To test hypothesis 1, bivariate correlation analyses were conducted to assess the correlation between OSG engagement and parent loneliness.

To test hypothesis 2, multiple regression assumptions were checked as outlined in Field (2005). The regression plots were visually inspected to check that assumptions of homoscedasticity, linearity, and normally distributed residuals were met sufficiently. The predictor variables were centred around their mean to reduce issues relating to multicollinearity when including both the predictor variables and their product terms in the same regression model (Iacobucci et al., 2017). Interaction terms between the following variables were created:

- Time spent on OSGs per day and social identification
- Time spent on OSGs per day and parental depression
- Time spent on OSGs per day and parental anxiety
- Time spent on OSGs per day and parental stress
- Number of posts written on OSGs per week and social identification
- Number of posts written on OSGs per week and parental depression
- Number of posts written on OSGs per week and parental anxiety
- Number of posts written on OSGs per week and parental stress

Multiple linear regression analyses were conducted, with each model including parental loneliness as the outcome variable and the interaction term, OSG engagement (time or number of posts) and parental outcome (social identification, depression, stress or anxiety) as predictor variables. A Bonferroni correction was applied to correct against type 1 error for multiple comparisons.

Results

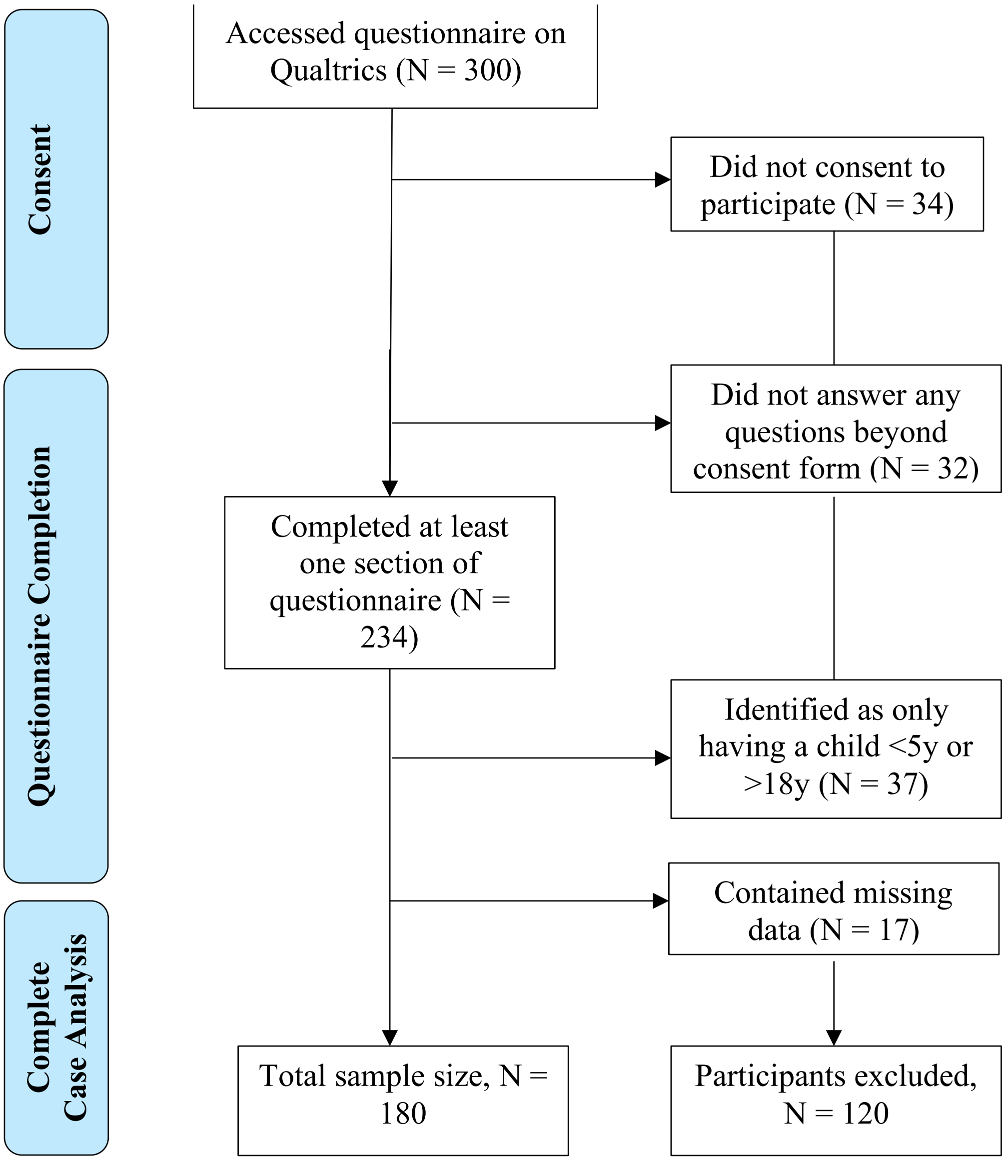
Participants

300 participants in total accessed the survey via Qualtrics, with 266 providing consent to take part, of which 234 completed at least one section of the questionnaire. 37 cases were excluded where participants reported only having a child either younger than five years of age or older than 18 years. Out of the 197 remaining cases, 8% cases (N = 17) contained missing data

whereby the questionnaire had been terminated early before all sections had been completed. These cases were removed, leaving a total sample size of 180 participants. Figure 4 shows a flow diagram representing the number of participants at each stage of the study

Figure 4.

Flow diagram showing number of participants at each stage of the study.



Descriptive Statistics

All data was analysed using IBM SPSS Statistics. Demographic information for parent participants is shown in in Table 6. Demographic information of the participants' children (parent-reported difficulties, engagement with and type of support for child's difficulties) are reported in Table 7.

Table 6.

Parent demographic information of the total sample.

Parent Demographics	Total Sample ($N = 180$)
Gender (N, %)	
Female	175 (97.2)
Male	5 (2.8)
Age (N, %)	
18 – 24	1 (.6)
25 – 34	20 (11.1)
35 – 44	109 (60.6)
45 – 54	44 (24.4)
55 – 64	6 (3.3)
Ethnicity (N, %)	
English, Welsh, Scottish, Northern Irish or British	155 (86.1)
Irish	2 (1.1)
Any other white background	13 (7.2)
Indian	2 (1.1)
Pakistani	2 (1.1)
Bangladeshi	1 (.6)
Chinese	1 (.6)
Any other Asian background	1 (.6)

White and Black Caribbean	1 (.6)
White and Asian	2 (1.1)
Marital Status (N, %)	
Married	124 (68.9)
Co-habiting	25 (13.9)
Divorced/Separated	15 (8.3)
Single	14 (7.8)
Civil Partnership	2 (1.1)
Parenting Status (N, %)	
Co-parenting	158 (87.8)
Lone parenting	16 (8.9)
Other	6 (3.3)
Currently engaging in parent support (N, %)	
No	137 (76.1)
Yes	43 (23.9)
Type of parent support (N, %)	
Parent WhatsApp group	58 (32.2)
Parenting skills group	10 (5.6)
Post-diagnostic (e.g., Autism, ADHD) support group	8 (4.4)
Other	15[a] (8.33)

[a] 'Other" parent support commented by participants included: coffee mornings (*N* = 5), friends (*N* = 3), church groups (*N* = 2), local parenting groups (*N* = 2), face to face support groups (*N* = 1), library group (*N* = 1) and school webinars (*N* = 1).

Table 7.

Parent-reported demographic information of their children.

Child Demographics	Total Number of Children ($N = 397$)
Mean Child Age	9.37
Child Age Range	2 months – 18 years
Mean number of children per respondent	2.21
Range of number of children per respondent	1 – 4
Parent-reported child difficulties in at least one child (N, %)	
No difficulties identified in any child	74 (41.1)
Anxiety difficulties	89 (49.4)
Mood difficulties	54 (30)
Difficulties relating to neurodevelopmental diagnosis	46 (25.6)
Friendship difficulties/bullying	38 (21.1)
School refusal	27 (7.2)
Feeding/eating difficulties	18 (10)
Behaviour problems at school	14 (7.8)
Self-harm	13 (7.2)
Physical health problem(s)	12 (6.7)
Difficulties relating to obsessive compulsive disorder	8 (4.4)
Other	10[a] (5.5)
Support for difficulties (N, %)	
Currently or waiting to receive support	74 (41.1)
Child and Adolescent Mental Health Services (CAMHS)	27 (15)
School (i.e., school counselling, support groups)	27 (15)
Other	20[b] (11.11)

[a] 'Other' parent-reported child difficulties included: "Early life trauma and attachment difficulties" ($N = 1$), 'lacking in confidence' ($N = 1$), 'not enjoying school' ($N = 1$), 'dyslexia' ($N = 1$), 'struggles with court ordered contact' ($N = 1$), 'gender issues' ($N = 1$),

'trauma from institutional abuse' (*N* = 1), 'toileting issues/mental health related' (*N* = 1), 'drugs and alcohol, risk taking behaviours, non-consequential thinking' (*N* = 1), 'year 6 Sat's and GCSE related stresses' (*N* = 1).

[b] 'Other' support for difficulties included: private therapy (*N* = 9), neurodevelopmental assessment (*N* = 4), paediatrician (*N* = 2), crisis support (*N* = 1), social care (*N* = 1), occupational therapy (*N* = 1), play therapy (*N* = 1), family therapy (*N* = 1).

The means, standard deviations and minimum and maximum scores on the continuous variables are presented in Table 8. The frequencies of categorical responses to each question of the online support group engagement measure are presented in Figures 5 – 9.

Table 8.

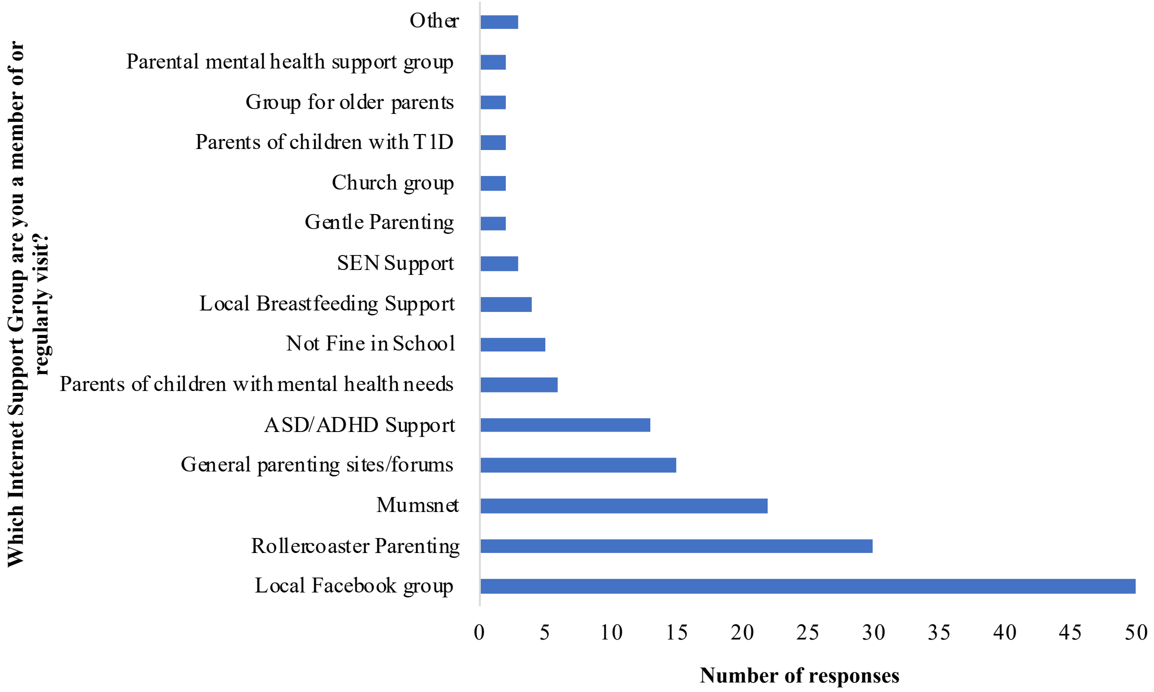
Descriptive statistics of parents' scores on continuous variables.

Measure	*M*	*SD*	Range
Parent Loneliness (UCLA scores)	45.3	12.7	21 – 78
Parent Stress (PSS scores)	43.2	10.0	25 – 76
Parent Anxiety (GAD-7 scores)	6.9	5.2	0 – 21
Parent Depression (PHQ-9 scores)	6.2	5.4	0 – 23
Parent Social Identification (FISI scores)	16.1	5.5	4 – 28

Note. Higher scores indicate greater levels of loneliness, stress, anxiety, depression and social identification.

Figure 5.

Bar graph showing the type of online support groups participants reported to frequently visit.



Note. 'Other' internet support group/forum include: 'Contact a Family' ($N = 1$), 'Reddit' ($N = 1$), 'Covid support' ($N = 1$).

Figure 6.

Pie chart showing the proportion of participants who regularly visit OSGs.

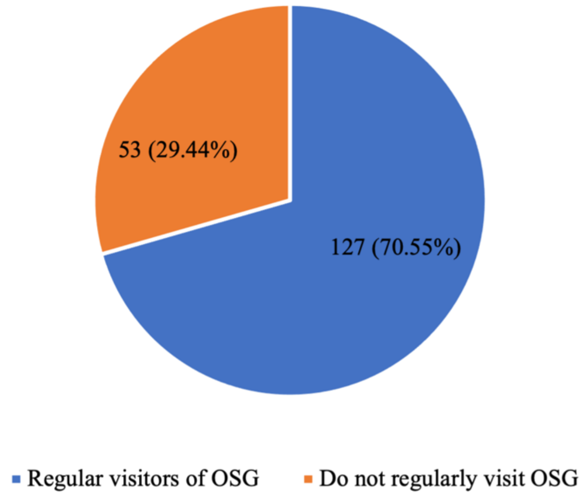


Figure 7.

Bar graph showing the number of minutes participants spend on OSGs in an average day.

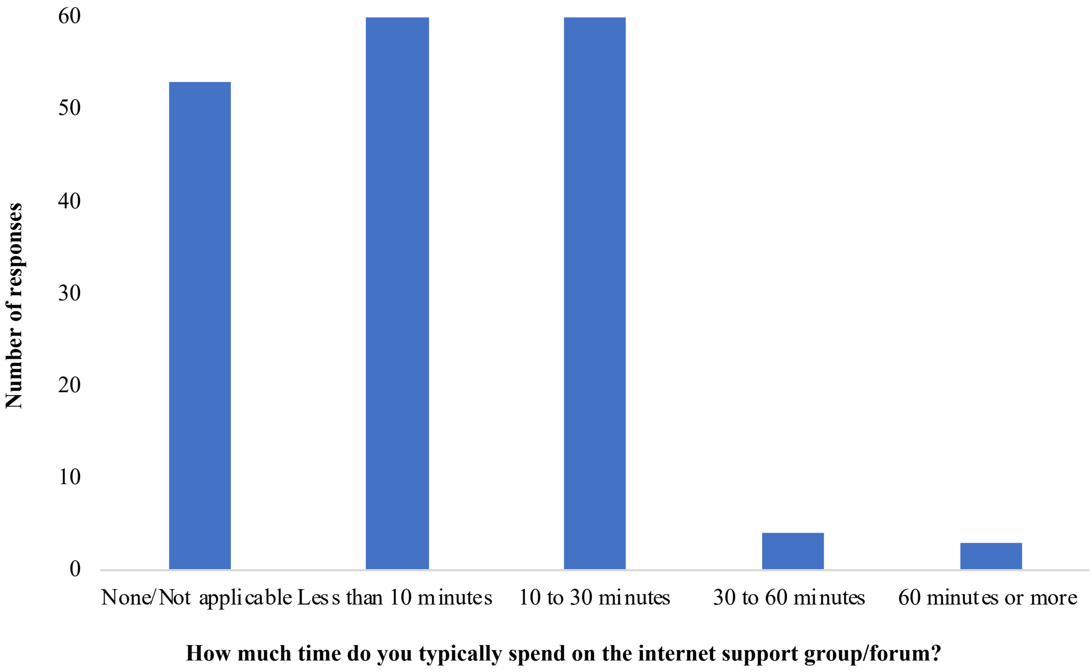


Figure 8.

Pie chart showing proportion of participants who had reported previously posting on an OSG.

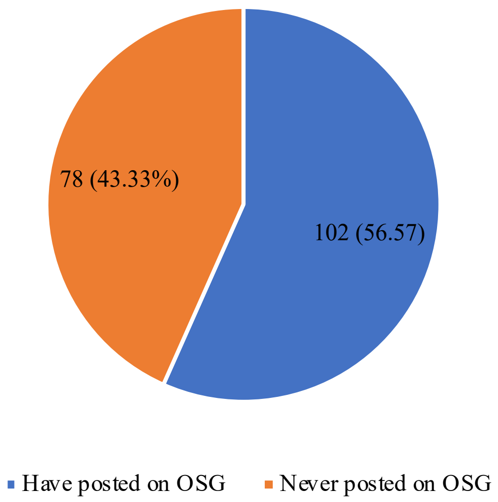
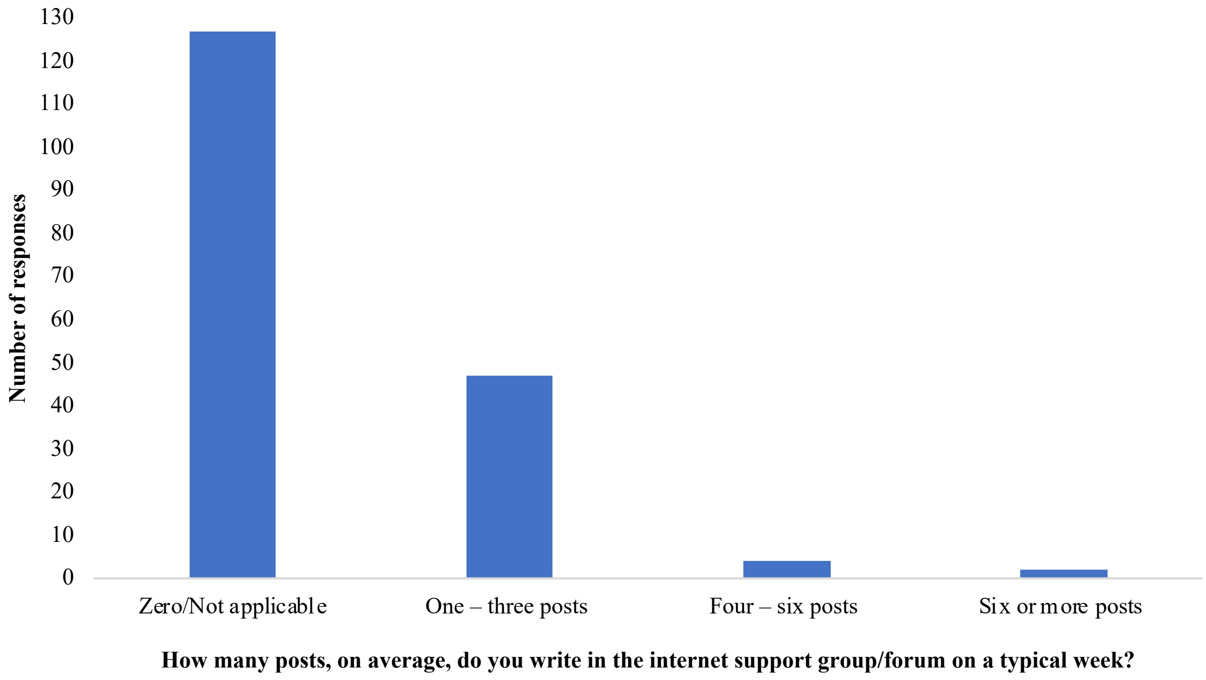


Figure 9.

Bar graph showing the average number of posts participants report writing on OSGs per week.



Key Features of Sample

The demographic characteristics of the sample were mostly females (97.2%), aged 35 – 44 years (60.6%) from White British backgrounds (86.1%). Similar sample distributions have been observed in previous studies investigating parental use of OSGs (Balkhi et al., 2014; Kosugi et al., 2021). Most participants did not identify as being engaged in other forms of parental support (76.1%), however the majority of participants who did report engaging with other forms of support commented that they belonged to parent WhatsApp groups (*N* = 58). This can be viewed as another form of parent-parent peer support (Ersöz, 2019).

A large proportion of the sample was made up of parents who identified as having at least one child currently struggling with an additional need/difficulty, as reported in Table 7 (58.9%). The most common category was child anxiety difficulties (49.4%), followed by mood difficulties (30%). 41.1% parents reported that their children are currently receiving or waiting to receive support for their difficulties, with CAMHS (15%) and school (15%) support being the most frequently reported service.

Most participants scored in the “none/minimal” or “mild” ranges on the GAD-7 (Spitzer et al., 2006) questionnaire (38.9% and 39.5%, respectively). This was the same for depression scores, as measured by the PHQ-9 (Kroenke et al., 2002), whereby 50% participants fell in the “none/minimal” range and 29.5% fell in the “mild” range.

In regards to OSG engagement, 70.6% participants reported that they were members of, or regularly used OSGs. Local Facebook groups for parents were the most commonly reported (27.8%), followed by Rollercoaster Parenting (16.7%), an OSG for parents of children with mental health difficulties, and Mumsnet (12.2%). Participants reported spending less than 10 minutes (33.3%) or 10 – 30 minutes (33.3%) browsing OSGs on an average day. A larger proportion of participants reported having previously posted on OSGs (56.6%) compared to those who had never posted, however only a small proportion reported posting one or more posts in an average week (29.4%), suggesting that the sample contained a relatively small number of participants who regularly post in OSGs.

Main Results

Hypothesis 1) There will be an association between engagement with OSGs and loneliness. Specifically, there will be a negative correlation between (i) the number of minutes parents spend using OSGs per average day and their levels of loneliness and (ii) between the number of posts parents write on OSGs per average week and their levels of loneliness.

Bivariate correlations were conducted to test the first hypothesis. Pearson's correlations were conducted for the continuous variables: parental loneliness, parental depression, parental stress, parental anxiety and social identification. Spearman's Rank correlations were conducted for the ordinal variables: number of minutes spent using online support groups per day and number of posts written on OSGs per week. A correlation matrix between the study variables is reported in Table 5.

Parental loneliness and parental engagement with OSGs were not significantly correlated. Parental loneliness was weakly negatively correlated with the number of minutes spent using OSGs per day and the number of posts written on online groups per week, but was not significantly negatively correlated with either of the online engagement measures (number of minutes spent using OSGs per day and number of posts written per week)

Table 9.

Zero Order Correlation Matrix.

	Parent Loneliness	Parent Stress	Parent Anxiety	Parent Depression	Social Identification	Online engagement – time per day	Online engagement – posts per week
Parent Loneliness		.313**	.491**	.521**	.079	-.143	-.103
Parent Stress			.295**	.314**	-.037	-.082	-.020
Parent Anxiety				.780**	.122	.030	-.021
Parent Depression					.108	.017	-.022
Social Identification						.051	.186*

*p<.05, **p<.01

Hypothesis 2) The relationship between engagement with online support groups and loneliness will be moderated by scores on the parental social identification, stress, depression and anxiety self-report measures.

Multiple regression analyses were conducted to test the second hypothesis. The two online engagement variables were treated as continuous variables for these analyses given the equal distance between the levels and the limited number of responses in categories missing an upper limit (that is, three participants selected the "60 minutes or more" response category and two participants selected the "six or more posts" response category) (Rhemtulla et al., 2012). To test the hypothesised interaction effects, interaction terms were created by the transform variable function, multiplying together the two centred predictor variables – e.g., social identification scores and time spent using OSGs per average day. These interaction terms were then included in the regression model, along with the two individual predictor variables as outlined in hypothesis 2.

Multiple regression assumptions were checked as outlined in Field (2005). No outliers were identified. Visual inspection of the regression plots suggested that assumptions of homoscedasticity, linearity, and normally distributed residuals were met sufficiently for the analysis to be considered reliable. Given the significant correlations between the predictor variables (parental stress, depression and anxiety), eight separate Bonferroni-corrected multiple regression models were analysed. A full summary can be found in Table 10.

The findings outlined in Table 10 demonstrate that none of the interaction terms involving any of the parental wellbeing outcomes (depression, stress or anxiety) or social identification and the online engagement variables significantly predicted parental loneliness. The hypothesis was therefore not supported as there was no moderation effect observed. It can, however, be noted that time spent using OSGs per day emerged as a significant individual predictor (at the $p<.05$ and $p<.01$ level, respectively) of parental loneliness in two out of eight regression models.

It can also be noted that parental depression, stress and anxiety significantly predicted parent loneliness in all the models in which they were included as predictors. To control for the problem with multicollinearity, a principal component analysis (PCA) (demonstrated in Figure 10) was conducted whereby a principal component variable relating to parental mental health was created by combining the parental depression, stress and anxiety variables (Perez, 2017). Two linear regression analyses were conducted containing the new PCA variable along with its interaction with the two online engagement measures and the separate online engagement predictor variables. Both regression models were significant – model 1 containing the parental mental health PCA variable, time spent using online support groups per average day and the interaction between the two was significant at the p <.001 level: ($R^2 = .33$, $F(3, 176) = 29.14$, p <.001). The PCA variable ($\beta = .56$, p <.001) and the online engagement variable ($\beta = -.15$, $p = .02$) accounted for a significant amount of variance in parents' loneliness scores, whilst the interaction term was not a significant predictor in the overall model ($\beta = -.01$, $p = .91$). Model 2 contained the parental mental health PCA variable, number of posts written on online support groups per average week and the interaction between the two. This model was also significant at the p <.001 level: ($R^2 = .33$, $F(3, 176) = 28.19$, p <.001). The PCA variable ($\beta = .56$, p <.001) accounted for a significant amount of variance in parental loneliness, whilst the number of posts written on online groups per average week ($\beta = -.10$, $p = .12$) and the interaction term ($\beta = -.07$, $p = 24$) were not significant predictors.

Figure 10.

Diagram showing the correlation of the principal component to each variable.

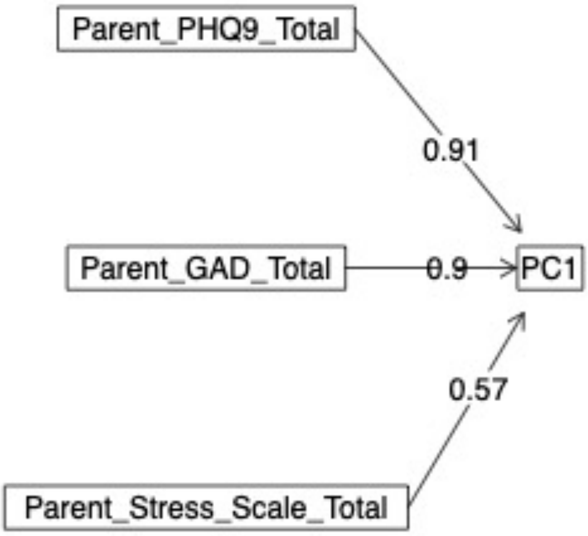


Table 10.

Summary of regression analyses predicting levels of parental loneliness.

	Predictor Statistics			*Model Summary*		
	Standardised β	*t*	p	*Significance*	*Total R^2*	*Adjusted R^2*
Model 1				.09	.04	.02
OSG Time [a]	-.16	-2.17	.03*			
Social Identification Score	.13	1.63	.11			
OSG Time*Social Identification	.10	1.28	.20			
Model 2				<.001***	.29	.28
OSG Time	-.16	-1.71	.09			
PHQ-9 Scores	.52	8.24	<.001***			
OSG Time*PHQ-9 Scores	.01	.15	.88			
Model 3				<.001***	.11	.10
OSG Time	-.13	-1.79	.08			
Stress Scores	.31	4.31	<.001***			
OSG Time*Stress Scores	.00	.01	.99			
Model 4				<.001***	.27	.26
OSG Time	-.16	-2.48	.01**			
GAD-7 Scores	.49	7.62	<.001***			

OSG Time*GAD-7 Scores	.05	.77	.44			
Model 5				.17	.03	.01
OSG Posts	-.14	-1.79	.08			
Social Identification Score	.12	1.51	.13			
OSG Posts* Social Identification	.06	.82	.41			
Model 6				<.001***	.28	.27
OSG Posts [b]	-.09	-1.35	.18			
PHQ-9 Scores	.51	7.92	<.001***			
OSG Posts*PHQ-9 Scores	-.02	-.32	.75			
Model 7				<.001***	.12	.10
OSG Posts	-.11	-1.57	.12			
Stress Scores	.31	4.34	<.001***			
OSG Posts*Stress Scores	.07	.94	.35			
Model 8				<.001***	.26	.24
OSG Posts	-.11	-1.76	.08			
GAD-7 Scores	.49	7.56	<.001***			
OSG Posts*GAD-7 Scores	-.04	-.61	.54			

[a] The number of minutes spent using online support groups per day.
[b] The number of posts written on online support groups per week.
*p<.05, **p<.01, ***p<.001

Discussion

Overview of findings

The primary aim of the current study was to establish whether parental engagement with OSGs (as defined on page 87) is associated with levels of parent loneliness. Specifically, it was hypothesised that there would be a negative correlation between (i) the number of minutes parents spend using OSGs per average day and their levels of loneliness, and between (ii) the number of posts parents write on OSGs in an average week and their levels of loneliness. Results from non-parametric correlation analyses did not provide support for this hypothesis because very weak (Dancey & Reidy, 2004) non-significant negative correlations were observed between the two online engagement variables and parental loneliness. The second hypothesis was that parents' scores on the social identification, depression, stress, and anxiety measures would moderate the relationship between OSG engagement and loneliness. Results from multiple regression analyses did not yield findings in support of this hypothesis, such that none of the aforementioned variables emerged as significant moderators. Parents' scores on depression, stress, and anxiety measures significantly predicted parental loneliness, however social identification was not a significant individual predictor. Interpretation of these findings in relation to the existing literature will be provided below.

Hypothesis 1: Parental Loneliness and Online Support Group Use

There is a dearth of research into parental loneliness (Nowland et al., 2021), and especially its relationship with OSG use, however the current study's finding that the two variables were not significantly associated is inconsistent with a previous study that investigated parents' loneliness in relation to their use of an online discussion forum for parents diagnosed with cancer (Kosugi et al., 2021). Their study's methodology differed to the current study's because parents' loneliness was not measured continuously, despite using the same self-report scale, and scores were instead divided into two groups (high and low loneliness) depending on whether they exceeded or fell below the median score, respectively. Multivariate logistic regression analysis revealed that the high loneliness group was significantly associated with the less frequent use of the OSG (less than once per week), whereas the low loneliness group was significantly associated with being active weekly users of the OSG. Their findings were therefore in line with the current study's hypothesis, such that more frequent OSG use would be associated with lower loneliness, but not with the current study's findings of no significant correlation between the two variables. The results from the current study are also inconsistent with findings from a previous study which investigated loneliness and OSG engagement in patients living with HIV/AIDS. Employing a similar methodology to the current study and conducting non-parametric correlation analyses, Mo and Coulson (2013) found that higher levels of OSG participation were significantly associated with lower levels of loneliness, which is also in line with previous findings in patients with breast cancer (Hoybye et al., 2005) and undergraduate students (Shaw & Gant, 2002).

These findings lead to questions about why the hypothesised association was not observed in the current sample of parents. One can postulate whether it might partly be due to the nature of the OSGs targeted in the current study containing a high level of variability compared to those investigated in previous studies. For instance, the aforementioned studies typically investigated specific OSGs that targeted individuals sharing particular diagnoses (i.e., HIV/AIDS or cancer), whereas the current study's sample contained parents who were accessing a wide range of OSGs, including support groups for particular subsets of parents (i.e., parents of children with neurodevelopmental disorders or diabetes) but also more general parenting websites such as local parent Facebook groups and wide-ranging discussion forums (i.e., Mumsnet) (see Figure 5). It could be argued that those accessing the more general parenting forums are less likely to form meaningful social connections on an emotional level, which have been found to be associated with reduced levels of loneliness (Shankar et al., 2015), due to using general OSGs for more practical advice. However, qualitative research into the posts written on Mumsnet has revealed parents using the website for emotional support and emotional expression, alongside advice and information (Croucher et al., 2020), indicating that parents do indeed offer and seek out emotional support on such platforms.

The levels of loneliness in the current study's population could also be considered as a reason as to why their OSG engagement did not significantly correlate with their loneliness scores. This is because it could be hypothesised that participants' scores would be less likely to be influenced by OSG engagement if participants demonstrated elevated loneliness scores, higher than those observed in other populations (Russell, 1996), thus requiring intensive intervention, such as addressing maladaptive social cognitions through cognitive behaviour therapy (Masi et al., 2011), for there to be an association with a decrease in loneliness levels. However, when comparing the descriptive statistics of the current study to Kosugi et al.'s (2021) sample, no large differences can be observed. The mean score on the UCLA Loneliness Scale Version 3 (Russell, 1996) in Kosugi et al.'s sample was 44.8 (*SD* = 11.8) which is comparable to the mean score obtained in the current study (*M* = 45.32, *SD* = 12.65). Furthermore, Kosugi et al. identified 164 participants as scoring in the 'low loneliness group' (defined as scores which fell below the mean UCLA score) and 170 participants in the ‘high loneliness group’ (defined as scores which fell above the mean UCLA score) and a similar distribution (98 participants scoring below the mean score versus 82 scoring above the mean score) was observed in the current study. Although not statistically analysed, observation of these descriptive statistics indicates that the sample in the current study were not more lonely than previous studies where significant correlations with online engagement have been observed.

Furthermore, one can postulate as to whether the elevated loneliness levels of parents who regularly access online support groups remain stable because of the reduced opportunity of social interaction compared to face-to-face settings. It can be argued that spending an increased amount of time reduces one’s opportunity for meaningful, in-person connections that are known to have a positive influence on loneliness (Haslam et al., 2022).

Hypothesis 2: Moderation by Parental Social Identification, Depression, Anxiety and Stress

The results did not provide support for the second hypothesis, such that parents’ scores on social identification, depression, stress, and anxiety measures were not significant moderators of the relationship between OSG engagement and parental loneliness. The finding that social identification was neither a significant moderating variable nor a significant predictor of parental loneliness is not in line with previous research demonstrating the effectiveness of interventions targeting social identification in reducing loneliness. In particular, it is not in line with any of the studies investigating the Groups4Health intervention in comparison to a control group, which demonstrated social identification as being a theoretical agent of change in ameliorating loneliness and depressive symptoms (Cruwys et al., 2021; Haslam et al., 2016; Haslam et al., 2019). The authors drew conclusions relating to the value of targeting social identification as a strategy for improving psychological outcomes due to the variable emerging as a significant individual predictor of participants' loneliness and depression scores (Haslam et al., 2016). However, it should be noted that the intervention was not superior when compared to an active, group-based CBT intervention (Cruwys et al., 2022). Instead, the groups showed comparable improvement in participants' psychological wellbeing at 12-months follow-up, therefore at present it has not been evidenced that social identification is superior to other mechanisms, such as the modification of maladaptive cognitions underpinned by CBT, in reducing loneliness.

One can also postulate whether the absence of an association between parents' levels of social identification and loneliness in the current study was due to the online nature of the support groups, as mentioned above. To date research has not been conducted into the influence of online versus face-to-face interactions on social identification, that is, the extent to which the medium via which individuals connect and communicate influences their levels of social identification. However related research has previously shown that online connections do not render the same benefits for psychological wellbeing compared to face-to-face interactions. Lima et al. (2017) found that the number and quality of face-to-face friendships were directly associated with self-reported mental health status in a community sample of 1053 individuals, however the same did not occur for online friendships. Furthermore, another study reported that online social connections effectively substituted and protected participants from psychological distress associated with social isolation but only during the most restrictive isolation stages of the COVID-19 pandemic when social distancing measures were at their highest, whereas face-to-face interactions were predictive of lower psychological distress throughout all the isolation stages (Marinucci et al., 2022).

This indicates that online interactions may not always mimic the benefits of face-to-face communication, and as such explain the reason as to why the association between social identification and loneliness was not observed in the current study. One can therefore question whether social identification would have a stronger association with parents' psychological outcomes (such as loneliness) in a face-to-face setting as opposed to an OSG.

As this is the first study to investigate parents' social identification levels, it might be the case that social identification is less of an important factor for this population as opposed to populations whereby it has been associated with psychological outcomes – for example, in cancer survivors (Steffens et al., 2021) and individuals with symptoms of PTSD (Muldoon et al., 2021). As aforementioned, previous research has focused on population groups where there is explicit commonality between group members that is theorised to enhance social identification (Häusser et al., 2020), yet the shared commonality (beyond the shared identity of being a parent) is less clear in the current sample due to the variability in the OSGs participants were accessing at the time of questionnaire completion. As Figure 5 demonstrates, local parent Facebook groups were the most commonly reported OSG in the current sample (27.8%), therefore it should be considered whether findings would differ for a particular subgroup of parents who share additional aspects of identity, for example, parents of children with a neurodevelopmental diagnosis or a chronic illness (Sartore et al., 2021). OSGs targeting such specific groups only made up a small proportion of the current sample (i.e., only 13 parents reported regularly visiting OSGs for parents of children with neurodevelopmental difficulties), therefore it would be beneficial for future studies to compare groups of parents in relation to social identification levels to explore whether child characteristics play a role in this relationship.

The current study found that parents' scores on measures of depression, stress, and anxiety significantly predicted their loneliness levels. This finding is consistent with existing literature regarding the substantial negative relationship between loneliness and psychological wellbeing across populations (Bhagchandani, 2017; Doman & Le Roux, 2012; Erzen & Çikrikci, 2018; Hyland et al., 2021; McNamara et al., 2021; Robb et al., 2020). It is also in line with studies that have investigated the impact of loneliness on parental health and wellbeing – for example, positive relationships between loneliness and parenting stress and distress have been reported in cross-sectional studies (Badaru et al., 2013; Kruse et al., 2014; Zaidi et al., 2017). In two longitudinal studies, loneliness was found to significantly predict postnatal depression and chronic depression, respectively, in mothers (Luoma et al., 2015; Luoma et al., 2019). In a further longitudinal study, depression levels were higher in both mothers and fathers experiencing prolonged feelings of loneliness (Junttila et al., 2015). As noted in Nowland et al.'s (2021) review of parental loneliness, studies to date (now including the current study) have not explored the direction of the relationship between parental loneliness and psychological outcomes and therefore it is unclear whether parental distress leads to feeling lonely or whether parental loneliness increases distress.

Strengths and Limitations

Several strengths of the current study can be noted. These include its novel contribution to the literature being the first known study to investigate the social identity approach to health in relation to parents and their use of OSGs. Despite not yielding significant findings, the study invites future research to consider the importance of this psychological theory in this population, especially given the positive and sustained impact social identity-building interventions have exerted on individuals' loneliness (Haslam et al., 2022). This study is also instrumental in filling the gap of research into parental loneliness by confirming that loneliness is associated with increased levels of depression, anxiety and stress, as observed in older populations (Huang et al., 2020). As aforementioned, given the established relationship between parental wellbeing and children's psychological outcomes (Kamis, 2021), it remains important to examine parental wellbeing and establish the interrelated constructs, so that future interventions can be effectively targeted. An additional strength of the current study is its use of well-validated measures to assess parents' psychological wellbeing and loneliness. Furthermore, the development of a measure to assess online engagement paves the way for future studies investigating OSGs to validate it as a measurement tool. The inclusion of questions to assess OSG usage both in terms of time and active participation (i.e., number of posts written) allows the distinguishment between passive and more active users/posters (Gazit et al., 2018; van Uden-Kraan et al., 2008). In the current study, neither of these variables were significantly associated with parental wellbeing constructs, however in future studies differences in outcomes may be observed. Finally, a further strength of this study is the sample exceeding the size required to achieve 80% power to detect a small – medium effect size, thus minimising the likelihood of a type 2 error.

Several limitations of the current study can also be reported. Firstly, as previously noted, the study employed a cross-sectional design therefore no conclusions regarding causality can be inferred. The study did not involve the measurement of parents' psychological wellbeing and social identification prior to engaging with OSGs, nor did it include a comparison group of parents who had never visited an OSG, thus causation cannot be implied or directly investigated. This is particularly pertinent to the significant positive association found between parental stress, depression and anxiety and parental loneliness – it is clear that these variables are significantly related in the current sample, yet it is difficult to determine whether high levels of loneliness lead to reduced psychological wellbeing or whether reduced psychological wellbeing leads to parents feeling more lonely. More specifically, one may suggest that parents experiencing higher stress levels in their parenting role might withdraw from social interactions and connections, leading to elevated feelings of loneliness. However, such causal inferences cannot be made from the current study. Future research (i.e., using cross-lagged designs where reciprocal relationships between loneliness and parents' psychological wellbeing over time can be examined, enabling direction of effect to be explored) is needed to further delineate this relationship.

Furthermore, only self-report data was collected in the current study, which precludes objective testing of the measured variables. This could be a potential limitation if responses were impacted by social desirability bias, thus reducing the generalisability of the findings. For example, parents might have been influenced to respond in a way that casts them in a positive light whilst answering certain questions in the survey, either in relation to their own psychological wellbeing or their self-reported child difficulties (Bornstein et al., 2015). As the variables assessed in the current study were subjective reports of psychological states and given the large sample size, the inclusion of observable measures would not have been practical, however bias could have been limited by the inclusion of a social desirability scale to assess parents' tendencies to respond in a socially desirable fashion. Putnick et al. (2010) employed this methodology in their study of parent stress so that social desirability bias could be controlled for in their analysis.

Relating to validity regarding the measurement of variables in the current study, it should be noted that a validated measure was not used to assess OSG engagement and that questions were instead adapted from previous research (e.g., Mo & Coulson, 2013) that also measured participation in OSGs. To the author's knowledge, there does not currently exist a validated measure of OSG engagement, and questions can be raised regarding the construct validity of the OSG engagement questionnaire created for the current study. Specifically, the previous study that contained a battery of similar questions (i.e., "When you visit or have visited the internet support group/forum, how much time do you typically spend on it?) explicitly asked participants about their engagement with two distinctive OSG for patients living with HIV/AIDS. Therefore, it was clear that participants' responses referred to the OSGs the researchers were interested in investigated. As the current study was investigating a broad range of OSGs and, as such, the term 'internet support group/forum was repeatedly used in the online engagement measure, it cannot be ascertained that participants shared the same understanding in terms of what constitutes an OSG. This understanding may have exerted an influence on their responses – for example, if a participant felt that they were not regularly engaging in an OSG as described in the questionnaire (description can be found in Appendix 4), their online engagement score may have been low. However, their score may have been higher if the description of the OSGs had been different. Regarding limitations relating to data analysis, some issues with the spread of scores can be noted. Most notably the wide spread and skewed distribution of the OSG variables may have impacted the fit of the regression model.

A further limitation to the current study relates to the heterogeneity and representativity of the sample. Parents of a wide age range of children were recruited and thus one can question whether the sample was too heterogeneous to allow the research questions to be answered. In contrast, a large proportion of participants (90%) identified as being of white ethnicity, with only 10% participants identifying as coming from a black or ethnic minority background. This raises questions about the generalisability of findings to a more diverse population.

Further questions about the generalisability of the findings can be raised due to the fact that a specific parent population was recruited for the current study, such that recruitment materials were designed to engage parents of children who are struggling. This limits any conclusions that can be applied to a population beyond this specific subgroup of parents who self-identified with the recruitment poster. Furthermore, over 97% of participants were mothers and less than 3% were fathers. This means that the generalisability of the current findings to fathers is limited. The true proportion of men versus women accessing OSGs is unknown, however online fatherhood forums have been described as acceptable, accessible and important platforms for fathers to seek and provide support (Teague & Shatte, 2021) therefore further research into the psychological outcomes associated with fathers' engagement is warranted. Additionally, the main recruitment strategy for the current study involved opportunistic sampling through OSGs themselves, which may have introduced sampling bias and thus impacted the external validity of the findings. Lastly, it can be noted that 37 cases were excluded from analysis due to participants not fulfilling the criteria of having a child between the age of 5 – 18 years. To avoid future studies having to exclude such data, participants could fill in a screening question prior to starting the rest of the questionnaire. Qualtrics could be programmed to only show participants the full questionnaire depending on their answer to the screening question(s).

Clinical Implications

The finding that loneliness is associated with parents' levels of stress, anxiety and depression has implications for future interventions targeting parents. This suggests the possibility of targeting these psychological outcomes through group interventions in order to also increase parents' social connections and reduce feelings of loneliness. For example, mindfulness interventions have been found to reduce parental stress (Burgdorf et al., 2019), therefore adding a group element so that parents can connect with each other might also ameliorate parental loneliness.

Even though OSG engagement was not significantly related to parental loneliness, one can still consider the findings in this study in terms of the acceptability of OSGs. The OSG engagement (see Figure 6) in the current study showed that over 70% of participants were members or, or regularly visited, OSGs. As noted above, the sample may disproportionately represent the number of parents accessing OSGs due to the online nature of the study and the recruitment strategy, however these findings still point towards OSGs as being useful and cost-effective resources for parents. Given the large proportion of parents in this study identifying as having at least one child with a difficulty (ranging from mental health difficulties to school problems and physical health difficulties), these findings have implications for families accessing, or trying to access, professional health services. In the UK, approximately one in four young people referred to mental health services were refused treatment in 2018 to 2019 (Crenna-Jennings & Hutchinson, 2020), and one in five young people experiencing symptoms relating to a mental health disorder reported a waiting time of over six months to receive specialist assistance, during which parents reported the absence of signposting to appropriate forms of interim support (YoungMinds, 2019). Given the high usage of OSGs by parents of children identified as having difficulties, one can suggest that online platforms may be a useful means to distribute professional, as well as peer, support to families waiting for formalised professional intervention.

Theoretical Implications and Recommendations for Future Research

This study adds to the literature on the social identity approach to health (Haslam et al., 2009) and the current findings suggest that this theory may not be particularly relevant in underpinning parents' use of OSGs. However, as noted above, several factors might explain the absence of a significant relationship between the two variables in the present study, including the qualities of the OSGs accessed by participants. It would be beneficial for future studies to examine whether the theory can be applied to online settings and whether virtual spaces can still provide an important platform for the 'social cure' to be facilitated. It would also be important for future, theory-driven research to be carried out in order to establish the understanding of the social identity approach to health in relation to parents – that is, questions from the current study can be raised as to whether parenthood is a binding, collective identity for individuals, or whether other factors need to be present (i.e., having shared experiences of looking after a child with similar difficulties, or being a single parent) in order for social identification to demonstrate a relationship with psychological wellbeing.

A further area for future research would be the development and evaluation of OSGs for families who are on existing waiting lists for professional support, due to the high level of usage of online support platforms observed in the current study. To test the effectiveness of the OSGs investigated in the current study, it would be important to conduct future randomised controlled trials to test the effect of such groups on parent psychological outcomes compared to a control group. It would also be important to investigate fathers' use of OSGs given previous qualitative research demonstrating how they can provide emotional and practical support (Teague & Shatte, 2021). Future studies recruiting a more representative sample and assessing psychological outcomes would be valuable. It would also be valuable for qualitative research to be conducted to allow for richer data in order to understand how OSG engagement relates to loneliness; it can be argued that the operationalisation of OSG use limits our understanding of how and why parents access these groups, therefore in-depth interviews with users would be a helpful addition to the existing research.

Furthermore, it would be interesting for the current study to be replicated at a time where there are no restrictions on social contact due to COVID-19. Even though participants in the current study were recruited at a time when there were no law-enforced lockdown restrictions in the UK, the Omicron variant was very prominent and as such individuals may not have been having the same number of social contacts as they normally would. It would be interesting to ascertain whether this social context resulted in parents accessing online support groups more or less frequently compared with a time when COVID-19 is less of a concern for individuals, and as such bears no impact on their usual face-to-face social interactions.

The current study demonstrated novelty in developing an online engagement measure to assess participants' level of usage of OSG. Future research is needed to aid in the development of a validated measurement tool to capture individuals' online behaviours. The current study measured engagement in terms of the amount of time spent accessing OSGs per day and the number of posts written on OSGs per week and, as such, it measured two levels of engagement. These levels can be conceptualised as passive versus more active engagement (van Uden-Kraan et al., 2008) and it would be important for future studies to establish whether both levels can be measured through the use of separate subscales, so that crucial questions can be addressed regarding the influence of engagement level on the benefits associated with individuals' use of the internet for support.

Conclusion

In conclusion, this is the first study to examine the impact of online support groups on loneliness and psychological wellbeing. Although the hypotheses were not supported, the findings indicated. The support groups are a potential untapped source of intervention that is likely to grow in importance as services are unable to meet demand. Optimising them and understanding their mechanisms of action will help ensure maximum effectiveness.

Integration, Impact, and Dissemination

Integration

The overall aim of the thesis was to explore the relationship between parents' use of online peer support groups and their mental wellbeing. The systematic review explored online parental peer support interventions and a range of psychological outcomes, whilst the empirical study investigated parents' use of online peer support groups in relation to self-reported loneliness, and whether their levels of depression, stress and anxiety moderated this relationship.

I wanted my systematic review to conceptually and/or theoretically link to my empirical study as closely as possible. Through my initial searches of the literature, I became aware of the growing importance of investigating online support services that are frequently accessed by parents worldwide due the huge increase in demand for conventional support services post-pandemic (Panchal et al., 2021). With many parents facing long waiting lists for support for either their own or their child's emotional wellbeing (YoungMinds, 2019), it made me consider the importance of conducting research in order to understand how alternative sources of support, such as online peer support, can impact parents' psychological outcomes. Given the growing number of individuals facing loneliness (Surkalim et al., 2022), and it being recognised as a prominent public health concern (Wigfield et al., 2020), I was initially interested in conducting a systematic review to investigate parental loneliness in relation to online peer support, especially given the opportunities peer support forums provide to form connections with individuals in similar situations (Dale et al., 2008). However, an a priori hand search suggested that there were not enough studies to justify such a review with a specific focus on parental loneliness, despite the shifting attention towards this phenomenon. It therefore seemed appropriate to broaden the focus to include a wider range of psychological outcomes. Although a previous integrative review (Niela-Vilén et al., 2014) into internet-based peer support for parents had been conducted, this needed updating given the development of internet resources that have occurred over the last eight years. Furthermore, their review had not included a specific focus on parents' psychological outcomes and no such synthesis (focusing solely on online peer support) existed. It was agreed with my supervisors that there was indeed a gap in the literature regarding the understanding of the impact of online parent peer support on parents' psychological outcomes.

Conceptualising Online Peer Support

Through conducting scoping searches as part of the systematic review process, I was alerted to the similarities between the reasons underlying parents' membership to online fora, such as Mumsnet (Croucher et al., 2020), and other populations, such as young carers (Widemalm & Hjärthag, 2015) and young people with mental health difficulties (Burns, Durkin & Nicholas, 2009). Qualitative research demonstrated that one of these reasons was the offering and receipt of emotional support, which has also emerged as a dominant theme for parents accessing more formalised peer support interventions, including peer support interventions for parents of children with physical health problems (Carlsson, Klarare & Mattsson, 2020; Hall, Ryan, Beatty & Grubbs, 2015) and developmental disabilities (Shilling, Logan & Morris, 2014). Adopting a similar approach to Niela-Vilén et al.'s (2014) review, I searched the literature for studies relating to the constructs of 'internet', 'peer support' and 'parents'. Most of the relevant studies that were produced by my search involved investigations into peer support interventions, whereby online connection between parents formed part of the intervention described as ‘peer support’. Two studies were included which focused on pre-existing online parent-parent discussion fora (e.g., Balkhi et al., 2017; Kosugi et al., 2021), but the former made up the majority of the included studies.

Throughout my systematic review and empirical project, the definitions I cited for such online discussion fora, (i.e., Preece’s (2003) definition: “any virtual social space where people come together to get and give information or support, to learn, or to find company”) and online peer support (i.e., communities of common interest where individuals give and receive help, ask questions and share experiences (Dale, Caramlau, Lindenmeyer, Williams, 2008)) were very similar, yet both definitions invite a vast amount of heterogeneity between the various forms of online parent support – such that, the popular parenting discussion forum Mumsnet could fall under both definitions, however so could a more formalised peer support group that is designed for a particular subgroup of parents and facilitated by professionals. Although there is a close link between the systematic review and empirical project, I reflect on the absence of studies that employed a specific focus on more user-driven, discussion fora as focused on in my empirical project and in Balkhi et al.’s (2014) and Kosugi et al.’s (2021) studies. As discussed in my empirical project, the investigation into the effectiveness of such user-led online support groups that are frequently accessed by parents worldwide (for example, Mumsnet, parenting Facebook groups) on parents’ psychological wellbeing is of paramount importance given the growing numbers of parents turning to such sources of online support from fellow parents without needing a referral or point of contact with a health professional. Acknowledging the huge increase in demand for conventional support services post-pandemic (Panchal, Kamal, Cox & Garfield, 2021), it is important for future research to investigate how the potential of alternative avenues of support can be maximised for parents and indeed other populations.

Synergy Between the Systematic Review and Empirical Project

The systematic review identified several studies that reported an association between online parent peer support and positive psychological outcomes. However, overall, the evidence regarding the effectiveness of online peer support on parents' psychological outcomes was inconclusive due to the small number of RCTs ($N = 6$) included, of which only one study (Douma et al., 2021) reported significant positive effects of their online peer support intervention on parents' psychological outcomes compared with a waitlist control group. This study along with findings from non-RCT studies reporting significant pre-post time effects of online peer support on parents' psychological outcomes, including stress, anxiety and depression provided a conceptual basis for the inclusion of these measures in the empirical study. The systematic review also identified one study that had included a measure of parental loneliness in their study of an online parent discussion forum, and it was found that participants who fell in the 'low loneliness' group were more active weekly users of the discussion forum as opposed to parents in the 'high loneliness' group. This provided a conceptual basis for the hypothesis that there would be a negative association between parental loneliness and online support group engagement and also emphasised the lack of empirical research investigating these two variables in parent populations.

The lack of significant findings in the empirical project can be considered as being unexpected due to the findings of the majority of studies included in the systematic review, however given only one study included a measure of loneliness (Kosugi et al., 2021), there remains a large amount of uncertainty regarding parental loneliness and the factors associated with this construct. As discussed in the empirical project, Kosugi and colleagues (2021) also employed a cross-sectional design, however their sample consisted of cancer patients with minor children. Therefore, one could argue that the shared diagnosis between parents contributed to their sense of social connection and thus influenced the association between low loneliness levels and high online group engagement. I was struck by the absence of studies that made reference to psychological theories in the systematic review and this motivated me to investigate the social identity approach to health in the empirical project. Despite not finding any significant associations in relation to the measure of social identification, the inclusion of a theoretical basis added to the novel contribution to the literature. I would be interested to see future research investigate social identification in subgroups of parents (i.e., parents sharing a similar diagnosis themselves or their children living with similar health conditions, neurodevelopmental disorders etc.).

Methodology of the Empirical Project

One conclusion drawn from the systematic review is that future high-quality blind RCT designs with diverse samples (i.e., the inclusion of both mothers and fathers) need to be conducted in the domain of online parental peer support. Conducting a RCT was beyond the scope of the empirical project and, given the novel investigation of parents' social identification, a cross-sectional design was deemed, in conjunction with my supervisors, as an appropriate first step. The need for randomised designs contrasts with the difficulty that this entails when investigating online discussion fora. This likely partly explains the dearth of studies that have employed this methodology to conduct research in this domain and why the RCTs that do exist have investigated professional-supported peer support interventions rather than user-led discussion fora available to the public (as described above). The primary difficulty in this domain is the inability to ensure that participants in control groups do not also access the publicly available discussion fora that is being investigated, thus not remaining true controls. Therefore, there exists a dilemma between balancing the advantages of such parent-parent support being highly accessible and available to all parents who may benefit from it, and the disadvantages of reducing accessibility (i.e., through the creation of private discussion fora, or private online support developed by the research team) with the interest of conducting high-quality scientific research. One potential method of resolving this might be to administer a self-report measure to both the control and intervention group to assess whether participants have accessed any similar interventions elsewhere on the internet. This could allow for such factors to be controlled for in analysis.

I reflect on the lack of service-user involvement in the current study. I recognise the value in involving service-users in multiple stages of research projects and this is something I will endeavour to include in future research ventures. In the current project, it might have been beneficial to seek parents' feedback on the questionnaire through a virtual focus group. This may have limited the large number of participants dropping out before completing the questionnaire, if it had been identified that the questionnaire was not deemed to be user-friendly in a way that was not identified by the trainee clinical psychologists who piloted the survey.

Integration into a wider context

When considering the thesis as a whole within a broader context, it seems to integrate well within the increased attention paid to loneliness as a worldwide public health concern as well as the increased focus on utilising the internet as an effective medium to deliver care. Loneliness was announced as the theme for Mental Health Awareness week 2022 (Mental Health Foundation, 2022), indicating that it is a very pertinent and valuable topic both for research and clinical investigation but also for public discussion so that individuals may become more aware of how to identify the signs of loneliness in themselves and others and how to support with this. The thesis also sits more broadly within the online context and within the shift towards online service delivery. An evolving and growing understanding of the way in which the internet can support the psychological wellbeing of different populations is crucial in the current health context, with waiting times and referral criteria escalating due to increased demand for services. Especially pertinent to the context of the current thesis is the population of parents caring for children with mental health difficulties. Given the difficulties young people face when trying to access appropriate mental health services and the lack of signposting to alternative forms of support often being cited by parents (YoungMinds, 2019), it appears to be of paramount importance to address this gap and find creative solutions to meet the high demand and varying needs of parents and their families in a cost-effective way. Peer support may be an important way of addressing this, as evidenced by a high proportion of the current study's sample identifying as having at least one child with anxiety (49.4%) and mood (30%) difficulties, thus future research is needed to establish the effectiveness for different parent populations.

Impact

Personal Impact

While conducting my thesis I reflected on my own use of the internet, both as a form of support and also as a means of connecting with others. I noticed how I would often turn to social media or other social websites during time periods when my face-to-face social connection was reduced, such as the weeks writing my thesis or during the more prolonged periods of lockdown restrictions. During these times I became even more aware how internet-based support may be appealing for individuals who have less free time available, such as those with caregiving responsibilities. Despite not being a parent, I share caring responsibilities for a family member and I have noticed myself turning to the internet to connect with others in similar situations. Discussion forums and social media pages for caregivers are easily accessible, and conducting this thesis made me aware of my high usage of such platforms which is something I had not overtly considered previously. This personal reflection fuels my interest in building the evidence base of the mechanisms and psychological outcomes associated with the use of such fora.

Professional Impact

I note the impact of my thesis on my own clinical practice. Working at present with young people and their families in a paediatric setting, I consider how I might ask patients about their use of online support groups to aid my formulation and understanding, particularly around their relationship to help (Reder & Fredman, 1996). When considering the family's support systems, I typically ask around extended family, friends, engagement with services and previous experiences of help. However, now I reflect on whether it is equally important to assess whether families identify as having online support structures, that would not necessarily be elicited through my questioning. Understanding patients' and parents' online connections may inform my broader understanding of their support-seeking behaviours and how these might be utilised to inform interventions.

Related to this, I reflect on how psychology services, particularly in paediatric settings but also more broadly, could do more to connect parents with one another. Given the relatively high regular usage of online support groups reported in the empirical project, social media platforms could be useful tools for health services to form those important connections between families. Being aware of the increased rates of loneliness in the general population and the elevated rates of social isolation in parents of children with complex needs (Dellve et al., 2006) makes me consider the valuable role health services can play in mitigating these risks.

I have also become aware of the impact completing this thesis exerts on my practice as a researcher. Prior to clinical training, I had fairly limited research experience and I had never conducted a systematic review. Therefore, I found the whole process challenging but valuable towards my varied skillset as a clinical psychologist. I appreciated the learning from my supervisors' expertise, as well as support from my peers. I have developed confidence in my research skills which will allow me to fulfil the full role of a clinical psychologist and work autonomously as a researcher in the future. I am aware that the scientist-practitioner model suggests a need for clinical psychologists to be involved in both research and clinical practice post qualification (Overholser, 2015), and conducting my thesis has fuelled my interest in continuing to develop my research skills post-training in order to contribute towards valuable service development.

Clinical Impact

With increasing pressure on healthcare budgets worldwide, strategies to improve both preventative and interventive mental healthcare strategies at lower costs are needed (Donker et al., 2015). The potential of internet-based approaches is recognised in the NHS Long Term Plan health policy document (Alderwick & Dixon, 2019). The plan outlines an intention to work alongside the voluntary sector, developers and individuals in the community to develop online-based mental health applications and services. Digitally enabled healthcare is still in its infancy in the UK, and there is a need to broadly understand the best ways to implement and utilise digital healthcare across a wide range of populations (Murphy et al., 2020). The overall topic of the current thesis forms part of this increasing interest in understanding digital, cost-effective interventions, their impact on psychological outcomes and how such interventions can be embedded in communities. Developing an understanding of the potential benefits of internet-based peer support for parents can guide future incentives for cost-effective family support, which can extend to other population groups such as online peer support for individuals with chronic health conditions (Thompson et al., 2022) or elderly populations (Tomasino et al., 2017).

The rapid expansion of online healthcare practice has been made even more critical and brought to the forefront during the COVID-19 pandemic. With this recognition couples the potential of improving digital service offerings to those in harder to reach communities more generally, such as those with disabilities and caregiving responsibilities (Pote et al., 2021).

Looking beyond the online support groups investigated in the current thesis, there exists opportunity for the development of more advanced, enriching digital peer support interventions using virtual reality technology. Virtual reality worlds combine the advantages of a three-dimensional immersive environment with the connectivity and peer support offered by social networks (Morie & Chance, 2011). Evidence of virtual reality interventions is still in its infancy, however there is emerging evidence of their effectiveness and acceptability – for example, a virtual reality peer support was reported to increase social skills in a small sample ($N = 12$) of individuals with a lived experience of schizophrenia (Rus-Calafell et al., 2014) and a virtual reality peer support exercise intervention was deemed to be feasible and acceptable by cancer patients in a small preliminary study (Ando, 2020). Noting the high levels of usage and engagement in online support groups reported in the current thesis can impact the development and investigation of more advanced, interactive and realistic peer support opportunities for a wide range of populations (Fortuna et al., 2019).

Impact on Future Research

Both the systematic review and the empirical project have contributed to advancing research in this area. The systematic review was the first in the field to review the impact of online peer support on parents' psychological outcomes in recent studies employing quantitative methodology, whilst the empirical project was the first to explore the social identity approach to health in relation to a parent population and their engagement with online support groups. It was also the first study to examine parental loneliness, as well as depression, stress and anxiety, in relation to their use of such groups. The majority of previous research in this area has been qualitative and focused on other populations, such as patients with physical health conditions (Mo & Coulson, 2013).

The systematic review and the empirical project also identified areas for future research in relation to online parent peer support. Firstly, there is a need for high-quality randomised studies to examine the effectiveness of online peer support interventions in parent populations in comparison to control groups (Fortuna et al., 2022). Being aware of the difficulties with controlling participants' use of the internet (and as such whether the control group remains a true control comparison due to the ease of accessing peer support on the internet), it is crucial for future research to consider designs that address this issue, such as administering an online support group engagement measure (i.e., one of the measures utilised in the empirical project) to both the control and intervention groups in order to control for it as a variable in analyses.

Secondly, it will be worthwhile for future research to consider the investigation of the social identity approach to health in different subgroups of parents, for example parents of children with a disability or chronic health condition, in order to identify whether such groups have an increased propensity to form social group memberships and thus display higher social group identification compared to parents who do not identify as sharing characteristics with each other beyond the role of being a parent.

Dissemination

The empirical study was disseminated via a presentation to the three clinical psychology training cohorts at Royal Holloway, which helped to disseminate the results to an interested audience from which feedback and questions were gained. There is also a plan to submit both the systematic review and empirical study to a journal for publication. Most of the research in the field of online peer support has been published in journals related to digital health, internet/mobile interventions, healthcare technologies and electronic innovations, thus the empirical project and systematic review will be submitted to either the JMIR Mental Health Journal or the Digital Health Journal. There is also a plan to submit the abstracts for presentation at relevant conferences, such as the MindTech Symposium which focuses on technology innovations in mental health care.

References

Abdollahi, F., Agajani-Delavar, M., Zarghami, M., & Lye, M.-S. (2016). Postpartum mental health in first-time mothers: a cohort study. *Iranian journal of psychiatry and behavioral sciences*, *10*(1).

Abidin, R., Flens, J. R., & Austin, W. G. (2006). *The parenting stress index*. Lawrence Erlbaum Associates Publishers.

Action for Children. (2017, November 2). *It Starts With Hello: A report looking into the impact of loneliness in children, young people and families.* Basw. https://www.basw.co.uk/system/files/resources/basw_94738-5_0.pdf

Ainbinder, J. G., Blanchard, L. W., Singer, G. H., Sullivan, M. E., Powers, L. K., Marquis, J. G., Santelli, B., & Parent, C. t. E. P. t. (1998). A qualitative study of parent to parent support for parents of children with special needs. *Journal of Pediatric Psychology*, *23*(2), 99-109.

Akman, I., Kuscu, K., Ozdemir, N., Yurdakul, Z., Solakoglu, M., Orhan, L., Karabekiroglu, A., & Ozek, E. (2006). Mothers' postpartum psychological adjustment and infantile colic. *Arch Dis Child*, *91*(5), 417-419. https://doi.org/10.1136/adc.2005.083790

Alderwick H, Dixon J (2019). The NHS long term plan. *BMJ*, 364. doi:10.1136/bmj.l84

Al-Yagon. (2008). On the Links between Aggressive Behaviour, Loneliness, and Patterns of Close Relationships among Non-Clinical School-Age Boys.

Alhusen, J. L. (2013). A longitudinal study of maternal attachment and infant developmental outcomes. https://doi.org/10.1007/s00737-013-0357-810.1007/s00737-013-0357-8.A

Ali, K., Farrer, L., Gulliver, A., & Griffiths, K. M. (2015). Online peer-to-peer support for young people with mental health problems: a systematic review. *JMIR mental health*, *2*(2), e4418.

Allen, K., & Rainie, L. (2002). Parents online. Pew Research Center: Internet, Science & Tech. https://policycommons.net/artifacts/629536/parents-online/1610840/ on 30 May 2022. CID: 20.500.12592/w3smkw.

Altman, D. G. (1999). *Practical statistics for medical research*. Chapman & Hall/CRC Press.

Anderson, M., Werner-Seidler, A., King, C., Gayed, A., Harvey, S., & O'Dea, B. (2018). Mental Health Training Programs for Secondary School Teachers: A Systematic Review. *School Mental Health*, *11*(3), 489-508.

Andersson, G., Berg, M., Riper, H., Huppert, J. D., & Titov, N. (2020). The Possible Role of Internet-Delivered Psychological Interventions in Relation to the COVID-19 Pandemic. *Clinical Psychology in Europe*, *2*(3), 1-4. https://doi.org/10.32872/cpe.v2i3.3941

Andersson, L., Sundstrom-Poromaa, I., Wulff, M., Astrom, M., & Bixo, M. (2006). Depression and anxiety during pregnancy and six months postpartum: a follow-up study. *Acta Obstet Gynecol Scand*, *85*(8), 937-944. https://doi.org/10.1080/00016340600697652

Ando, M., Sumitani, M., Sakamura, M., Noguchi, T., Oki, R., Abe, H., Inoue, R., Tsuchida, R., Uchida, K. (2020). Tele Virtual Reality-based Peer Support Programme for Cancer Patients: A Preliminary Feasibility and Acceptability Study. *British Journal of Cancer Research*, *3*(4). https://doi.org/10.31488/bjcr.159

Andrews, G., Peters, L., & Teesson, M. (1994). The measurement of consumer outcome in mental health: a report to the National Mental Health Information Strategy Committee. *Sydney: Clinical Research Unit for Anxiety Disorders*.

Badaru, U. M., Ogwumike, O. O., Adeniyi, A. F., & Kaka, B. (2013). Psychosocial adversities and depression in mothers of children with cerebral palsy in Nigeria. *Journal of Pediatric Neurology*, *11*(1), 1-7.

Balkhi, A. M., Reid, A. M., McNamara, J. P., & Geffken, G. R. (2014). The diabetes online community: the importance of forum use in parents of children with type 1 diabetes. *Pediatr Diabetes*, *15*(6), 408-415. https://doi.org/10.1111/pedi.12110

Barreto, M., Victor, C., Hammond, C., Eccles, A., Richins, M. T., & Qualter, P. (2021). Loneliness around the world: Age, gender, and cultural differences in loneliness. *Pers Individ Dif*, *169*, 110066. https://doi.org/10.1016/j.paid.2020.110066

Beckers, L., Smeets, R., de Mooij, M., Piskur, B., van der Burg, J., Rameckers, E., Aarts, P., Author Group, C., & Janssen-Potten, Y. (2022). Process Evaluation of Home-based Bimanual Training in Children with Unilateral Cerebral Palsy (The COAD-study): A Mixed Methods Study. *Dev Neurorehabil*, *25*(4), 246-262. https://doi.org/10.1080/17518423.2021.2011459

Berkman, L. F., & Krishna, A. (2015). Social Epidemiology. In *Social Network Epidemiology*. Oxford University Press. https://doi.org/10.1093/med/9780195377903.003.0007

Bhagchandani, R., K. (2017). Effect of loneliness on the psychological well-being of college students. *International Journal of Social Science and Humanity*, *7*(1), 60. https://doi.org/10.18178/ijssh.2017.7.1.796

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: an updated literature review. *Journal of psychosomatic research*, *52*(2), 69-77.

Bliuc, A.-M., Best, D., & Moustafa, A. A. (2020). Accessing addiction recovery capital via online and offline channels: The role of peer-support and shared experiences of addiction. *Cognitive, Clinical, and Neural Aspects of Drug Addiction*, *251.*

Bojdani, E., Rajagopalan, A., Chen, A., Gearin, P., Olcott, W., Shankar, V., Cloutier, A., Solomon, H., Naqvi, N. Z., & Batty, N. (2020). COVID-19 pandemic: impact on psychiatric care in the United States. *Psychiatry Research*, *289*, 113069.

Bonin, M. F., McCreary, D. R., & Sadava, S. W. (2000). Problem drinking behavior in two community-based samples of adults: influence of gender, coping, loneliness, and depression. *Psychol Addict Behav*, *14*(2), 151-161. https://doi.org/10.1037//0893-164x.14.2.151

Boogerd, E., Maas-Van Schaaijk, N. M., Sas, T. C., Clement-de Boers, A., Smallenbroek, M., Nuboer, R., Noordam, C., & Verhaak, C. M. (2017). Sugarsquare, a Web-Based Patient Portal for Parents of a Child With Type 1 Diabetes: Multicenter Randomized Controlled Feasibility Trial. *J Med Internet Res*, *19*(8), e287. https://doi.org/10.2196/jmir.6639

Bornstein, M. H., Putnick, D. L., Lansford, J. E., Pastorelli, C., Skinner, A. T., Sorbring, E., Tapanya, S., Uribe Tirado, L. M., Zelli, A., & Alampay, L. P. (2015). Mother and father socially desirable responding in nine countries: Two kinds of agreement and relations to parenting self-reports. *International Journal of Psychology*, *50*(3), 174-185.

Bouchard, L., Montreuil, M., & Gros, C. (2010). Peer support among inpatients in an adult mental health setting. *Issues in Mental Health Nursing*, *31*(9), 589-598.

Bracke, P., Christiaens, W., & Verhaeghe, M. (2008). Self-esteem, self-efficacy, and the balance of peer support among persons with chronic mental health problems. *Journal of Applied Social Psychology*, *38*(2), 436-459.

Bray, I., Noble, S., Robinson, R., Molloy, L., & Tilling, K. (2017). Mode of delivery affected questionnaire response rates in a birth cohort study. *J Clin Epidemiol*, *81*, 64-71. https://doi.org/10.1016/j.jclinepi.2016.09.004

Brehaut, J. C., Garner, R. E., Miller, A. R., Lach, L. M., Klassen, A. F., Rosenbaum, P. L., & Kohen, D. E. (2011). Changes over time in the health of caregivers of children with health problems: growth-curve findings from a 10-year Canadian population-based study. *Am J Public Health*, *101*(12), 2308-2316. https://doi.org/10.2105/AJPH.2011.300298

Brehaut, J. C., Kohen, D. E., Garner, R. E., Miller, A. R., Lach, L. M., Klassen, A. F., & Rosenbaum, P. L. (2009). Health among caregivers of children with health problems: findings from a Canadian population-based study. *Am J Public Health*, *99*(7), 1254-1262. https://doi.org/10.2105/AJPH.2007.129817

Bu, F., Steptoe, A., & Fancourt, D. (2020). Loneliness during a strict lockdown: Trajectories and predictors during the COVID-19 pandemic in 38,217 United Kingdom adults. *Soc Sci Med*, *265*, 113521. https://doi.org/10.1016/j.socscimed.2020.113521

Bull, L. (2003). The Use of Support Groups by Parents of Children with Dyslexia. *Early Child Development and Care*, *173*(2-3), 341-347. https://doi.org/10.1080/03004430303092

Burgdorf, V., Szabó, M., & Abbott, M. J. (2019). The Effect of Mindfulness Interventions for Parents on Parenting Stress and Youth Psychological Outcomes: A Systematic Review and Meta-Analysis. *Front Psychol*, *10*, 1336. https://doi.org/10.3389/fpsyg.2019.01336

Cella, D., Riley, W., Stone, A., Rothrock, N., Reeve, B., Yount, S., Amtmann, D., Bode, R., Buysse, D., Choi, S., Cook, K., DeVellis, R., DeWalt, D., Fries, J. F., Gershon, R., Hahn, E. A., Lai, J.-S., Pilkonis, P., Revicki, D., . . . Hays, R. (2010). The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks:

2005–2008. *Journal of Clinical Epidemiology*, *63*(11), 1179-1194. https://doi.org/10.1016/j.jclinepi.2010.04.011

Chakraborti, M., Gitimoghaddam, M., McKellin, W. H., Miller, A. R., & Collet, J.-P. (2021). Understanding the Implications of Peer Support for Families of Children With Neurodevelopmental and Intellectual Disabilities: A Scoping Review. *Frontiers in public health*, *9*.

Clifford, T., & Minnes, P. (2013). Who participates in support groups for parents of children with autism spectrum disorders? The role of beliefs and coping style. *J Autism Dev Disord*, *43*(1), 179-187. https://doi.org/10.1007/s10803-012-1561-5

Cousino, M. K., & Hazen, R. A. (2013). Parenting stress among caregivers of children with chronic illness: a systematic review. *J Pediatr Psychol*, *38*(8), 809-828. https://doi.org/10.1093/jpepsy/jst049

Croucher, L., Mertan, E., Shafran, R., & Bennett, S. D. (2020). The Use of Mumsnet by Parents of Young People With Mental Health Needs: Qualitative Investigation. *JMIR Ment Health*, *7*(9), e18271. https://doi.org/10.2196/18271

Crenna-Jennings, W., & Hutchinson, J. (2020). *Access to child and adolescent mental health services in 2019*. Education Policy Institute. https://epi.org.uk/wp-content/uploads/2020/01/Access-to-CAMHS- in-2019_EPI.pdf

Crum, K. I., & Moreland, A. D. (2017). Parental Stress and Children’s Social and Behavioral Outcomes: The Role of Abuse Potential over Time. *Journal of Child and Family Studies*, *26*(11), 3067-3078. https://doi.org/10.1007/s10826-017-0822-5

Cruwys, T., Haslam, C., Rathbone, J. A., Williams, E., Haslam, S. A., & Walter, Z. C. (2022). Groups 4 Health versus cognitive-behavioural therapy for depression and loneliness in young people: randomised phase 3 non-inferiority trial with 12-month follow-up. *Br J Psychiatry*, *220*(3), 140-147. https://doi.org/10.1192/bjp.2021.128

Cruwys, T., Haslam, S. A., Dingle, G. A., Haslam, C., & Jetten, J. (2014). Depression and Social Identity: An Integrative Review. *Pers Soc Psychol Rev*, *18*(3), 215-238. https://doi.org/10.1177/1088868314523839

Cruwys, T., Haslam, C., Rathbone, J. A., Williams, E., & Haslam, S. A. (2021). Groups 4 Health protects against unanticipated threats to mental health: Evaluating two interventions during COVID-19 lockdown among young people with a history of depression and loneliness. Journal of Affective Disorders, 295, 316-322.

Dale, J., Caramlau, I. O., Lindenmeyer, A., & Williams, S. M. (2008). Peer support telephone calls for improving health. *Cochrane Database Syst Rev*(4), CD006903. https://doi.org/10.1002/14651858.CD006903.pub2

Dancey, C. P., & Reidy, J. (2007). *Statistics without maths for psychology*. Pearson education.

Daneback, K., & Plantin, L. (2008). Research on parenthood and the Internet: Themes and trends. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *2*(2).

Darwin, Z., Galdas, P., Hinchliff, S., Littlewood, E., McMillan, D., McGowan, L., Gilbody, S., Born, & Bred in Yorkshire, t. (2017). Fathers' views and experiences of their own mental health during pregnancy and the first postnatal year: a qualitative interview study of men participating in the UK Born and Bred in Yorkshire (BaBY) cohort. *BMC Pregnancy Childbirth*, *17*(1), 45. https://doi.org/10.1186/s12884-017-1229-4

Davis, E. P., Glynn, L. M., Waffarn, F., & Sandman, C. A. (2011). Prenatal maternal stress programs infant stress regulation. *J Child Psychol Psychiatry*, *52*(2), 119-129. https://doi.org/10.1111/j.1469-7610.2010.02314.x

DeAndrea, D. C., & Anthony, J. C. (2013). Online peer support for mental health problems in the United States: 2004–2010. *Psychological Medicine*, *43*(11), 2277-2288.

Della Vedova, A. M., Ducceschi, B., Cesana, B. M., & Imbasciati, A. (2011). Maternal bonding and risk of depression in late pregnancy: a survey of Italian nulliparous women. *Journal of Reproductive and Infant Psychology*, *29*(3), 208-222. https://doi.org/10.1080/02646838.2011.592973

Dennis, C.-L. (2003). Peer support within a health care context: a concept analysis. *International Journal of Nursing Studies*, *40*(3), 321-332. https://doi.org/10.1016/s0020-7489(02)00092-5

Dennis, C. L., Hodnett, E., Kenton, L., Weston, J., Zupancic, J., Stewart, D. E., & Kiss, A. (2009). Effect of peer support on prevention of postnatal depression among high risk women: multisite randomised controlled trial. *Bmj*, *338*, a3064. https://doi.org/10.1136/bmj.a3064

Diefenbeck, C. A., Klemm, P. R., & Hayes, E. R. (2017). "Anonymous Meltdown": Content Themes Emerging in a Nonfacilitated, Peer-only, Unstructured, Asynchronous Online Support Group for Family Caregivers. *Comput Inform Nurs*, *35*(12), 630-638. https://doi.org/10.1097/CIN.0000000000000376

Doctoroff, G. L., Greer, J. A., & Arnold, D. H. (2006). The relationship between social behavior and emergent literacy among preschool boys and girls. *Journal of Applied Developmental Psychology*, *27*(1), 1-13. https://doi.org/10.1016/j.appdev.2005.12.003

Doman, L. C., & Le Roux, A. (2012). The relationship between loneliness and psychological well-being among third-year students: A cross-cultural investigation. *International Journal of Culture and Mental Health*, *5*(3), 153-168.

Domoney, J., Iles, J., & Ramchandani, P. (2018). Fathers in the perinatal period: Taking their mental health into account. In P. Leach (Ed.), Transforming infant wellbeing: Research, policy and practice for the first 1001 critical days (pp. 205–214). Routledge/Taylor & Francis Group.

Donker, T., Blankers, M., Hedman, E., Ljótsson, B., Petrie, K., & Christensen, H. (2015). Economic evaluations of Internet interventions for mental health: a systematic review. *Psychol Med*, *45*(16), 3357-3376. https://doi.org/10.1017/s0033291715001427

Dosani, S., Harding, C., & Wilson, S. (2014). Online groups and patient forums. *Curr Psychiatry Rep*, *16*(11), 507. https://doi.org/10.1007/s11920-014-0507-3

Doull, M., O'Connor, A., Robinson, V., Tugwell, P., & Wells, G. (2005). Peer support strategies for people with chronic disease to enhance health and promote health equity. *Cochrane Database of Systematic Reviews*, *3*, 10.10002.

Douma, M., Maurice-Stam, H., Gorter, B., Krol, Y., Verkleij, M., Wiltink, L., Scholten, L., & Grootenhuis, M. A. (2021). Online psychosocial group intervention for parents: Positive effects on anxiety and depression. *J Pediatr Psychol*, *46*(2), 123-134. https://doi.org/10.1093/jpepsy/jsaa102

Drouin, M., McDaniel, B. T., Pater, J., & Toscos, T. (2020). How Parents and Their Children Used Social Media and Technology at the Beginning of the COVID-19 Pandemic and Associations with Anxiety. *Cyberpsychol Behav Soc Netw*, *23*(11), 727-736. https://doi.org/10.1089/cyber.2020.0284

Duffecy, J., Grekin, R., Hinkel, H., Gallivan, N., Nelson, G., & O'Hara, M. W. (2019). A Group-Based Online Intervention to Prevent Postpartum Depression (Sunnyside): Feasibility Randomized Controlled Trial. *JMIR Ment Health*, *6*(5), e10778. https://doi.org/10.2196/10778

Dumka, L. E., Stoerzinger, H. D., Jackson, K. M., & Roosa, M. W. (1996). Examination of the cross-cultural and cross-language equivalence of the parenting self-agency measure. *Family Relations*, 216-222.

Eaton, K., Ohan, J. L., Stritzke, W. G. K., & Corrigan, P. W. (2016). Failing to Meet the Good Parent Ideal: Self-Stigma in Parents of Children with Mental Health Disorders.

Journal of Child and Family Studies, *25*(10), 3109-3123. https://doi.org/10.1007/s10826-016-0459-9

El-Osta, A., Alaa, A., Webber, I., Riboli Sasco, E., Bagkeris, E., Millar, H., Vidal-Hall, C., & Majeed, A. (2021). How is the COVID-19 lockdown impacting the mental health of parents of school-age children in the UK? A cross-sectional online survey. *BMJ Open*, *11*(5), e043397. https://doi.org/10.1136/bmjopen-2020-043397

Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior research methods, instruments, & computers, 28*(1), 1-11.

Ersöz, S. (2019). Understanding WhatsApp Parent Group's Dynamics: Group Communication and Information Sharing. *Manas Sosyal Araştırmalar Dergisi*, *8*(1), 1136-1052.

Erzen, E., & Çikrikci, Ö. (2018). The effect of loneliness on depression: A meta-analysis. *International Journal of Social Psychiatry*, *64*(5), 427-435.

Evans, A. (2001). Cohort study of depressed mood during pregnancy and after childbirth. *Bmj*, *323*(7307), 257-260.

Eysenbach, G. (2004). Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res*, *6*(3), e34. https://doi.org/10.2196/jmir.6.3.e34

Fakoya, O. A., McCorry, N. K., & Donnelly, M. (2020). Loneliness and social isolation interventions for older adults: a scoping review of reviews. *BMC Public Health*, *20*(1), 129. https://doi.org/10.1186/s12889-020-8251-6

Fear, N., & Wessely, S. (2017). Is it 'good to share'? Intergenerational transmission of post-traumatic stress disorder. *Acta Psychiatrica Scandinavica*, *135*(5), 361-362.

Feder, A., Alonso, A., Tang, M., Liriano, W., Warner, V., Pilowsky, D., Barranco, E., Wang, Y., Verdeli, H., & Wickramaratne, P. (2009). Children of low-income depressed mothers: Psychiatric disorders and social adjustment. *Depression and Anxiety*, *26*(6), 513-520.

Feizi. (2014). Parenting stress among mothers of children with different physical, mental, and psychological problems.

Field, A. (2005). *Discovering statistics using SPSS, 2nd ed*. Sage Publications, Inc.

Figueiredo, B., & Conde, A. (2011). Anxiety and depression in women and men from early pregnancy to 3-months postpartum. *Arch Womens Ment Health*, *14*(3), 247-255. https://doi.org/10.1007/s00737-011-0217-3

Fihrer, I., McMahon, C. A., & Taylor, A. J. (2009). The impact of postnatal and concurrent maternal depression on child behaviour during the early school years. *J Affect Disord*, *119*(1-3), 116-123. https://doi.org/10.1016/j.jad.2009.03.001

Fisher, E. B., Boothroyd, R. I., Coufal, M. M., Baumann, L. C., Mbanya, J. C., Rotheram-Borus, M. J., Sanguanprasit, B., & Tanasugarn, C. (2012). Peer support for self-management of diabetes improved outcomes in international settings. *Health affairs*, *31*(1), 130-139.

Fortuna, K. L., Marceau, S. R., Kadakia, A., Pratt, S. I., Varney, J., Walker, R., Myers, A. L., Thompson, S., Carter, K., Greene, K., & Pringle, W. (2022). Peer Support Specialists' Perspectives of a Standard Online Research Ethics Training: Qualitative Study. *JMIR Form Res*, *6*(2), e29073. https://doi.org/10.2196/29073

Fortuna, K. L., Venegas, M., Umucu, E., Mois, G., Walker, R., & Brooks, J. M. (2019). The Future of Peer Support in Digital Psychiatry: Promise, Progress, and Opportunities. *Curr Treat Options Psychiatry*, *6*(3), 221-231. https://doi.org/10.1007/s40501-019-00179-7

Frenzel, S. B., Junker, N. M., Avanzi, L., Bolatov, A., Haslam, S. A., Häusser, J. A., Kark, R., Meyer, I., Mojzisch, A., & Monzani, L. (2022). A trouble shared is a trouble halved: The role of family identification and identification with humankind in well-being during the COVID-19 pandemic. *British Journal of Social Psychology*, *61*(1), 55-82.

Frigerio, A., Cattaneo, C., Cataldo, M., Schiatti, A., Molteni, M., & Battaglia, M. (2004). Behavioral and emotional problems among Italian children and adolescents aged 4 to 18 years as reported by parents and teachers. *European Journal of Psychological Assessment*, *20*(2), 124-133.

Funderburk, B. W., Ware, L. M., Altshuler, E., & Chaffin, M. (2008). Use and feasibility of telemedicine technology in the dissemination of parent-child interaction therapy. *Child Maltreatment*, *13*(4), 377-382.

Gardiner, C., Geldenhuys, G., & Gott, M. (2018). Interventions to reduce social isolation and loneliness among older people: an integrative review. *Health & Social Care in the Community*, *26*(2), 147-157.

Gazit, T., Bronstein, J., Amichai-Hamburger, Y., Aharony, N., Bar-Ilan, J., & Perez, O. (2018). Active participants and lurkers in online discussion groups: an exploratory analysis of focus group interviews and observation.

Giardinelli, L., Innocenti, A., Benni, L., Stefanini, M., Lino, G., Lunardi, C., Svelto, V., Afshar, S., Bovani, R., & Castellini, G. (2012). Depression and anxiety in perinatal period: prevalence and risk factors in an Italian sample. *Archives of Women's Mental Health*, *15*(1), 21-30.

Gonçalves, H., Pearson, R. M., Horta, B., González-Chica, D., Castilho, E., Damiani, M., Lima, R., Gigante, D., Barros, F. C., & Stein, A. (2016). Maternal depression and anxiety predicts the pattern of offspring symptoms during their transition to adulthood. *Psychological Medicine*, *46*(2), 415-424.

Greenaway, K. H., Cruwys, T., Haslam, S. A., & Jetten, J. (2016). Social identities promote well-being because they satisfy global psychological needs. *European Journal of Social Psychology*, *46*(3), 294-307. https://doi.org/10.1002/ejsp.2169

Griffin, S. C., Williams, A. B., Ravyts, S. G., Mladen, S. N., & Rybarczyk, B. D. (2020). Loneliness and sleep: A systematic review and meta-analysis. *Health Psychol Open*, *7*(1), 2055102920913235. https://doi.org/10.1177/2055102920913235

Groarke, J. M., Berry, E., Graham-Wisener, L., McKenna-Plumley, P. E., McGlinchey, E., & Armour, C. (2020). Loneliness in the UK during the COVID-19 pandemic: Cross-sectional results from the COVID-19 Psychological Wellbeing Study. *PLoS One*, *15*(9), e0239698. https://doi.org/10.1371/journal.pone.0239698

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. https://doi.org/10.1186/1471-2458-12-918

Haslam, C., Cruwys, T., Chang, M. X.-L., Bentley, S. V., Haslam, S. A., Dingle, G. A., & Jetten, J. (2019). GROUPS 4 HEALTH reduces loneliness and social anxiety in adults with psychological distress: Findings from a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *87*(9), 787.

Haslam, C., Cruwys, T., Haslam, S. A., Dingle, G., & Chang, M. X.-L. (2016). Groups 4 Health: Evidence that a social-identity intervention that builds and strengthens social group membership improves mental health. *Journal of Affective Disorders*, *194*, 188-195. https://doi.org/https://doi.org/10.1016/j.jad.2016.01.010

Haslam, D. M., Tee, A., & Baker, S. (2017). The use of social media as a mechanism of social support in parents. *Journal of Child and Family Studies*, *26*(7), 2026-2037. https://doi.org/10.1007/s10826-017-0716-6

Haslam, S. A., Haslam, C., Cruwys, T., Jetten, J., Bentley, S. V., Fong, P., & Steffens, N. K. (2022). Social identity makes group-based social connection possible: Implications for loneliness and mental health. *Curr Opin Psychol*, *43*, 161-165. https://doi.org/10.1016/j.copsyc.2021.07.013

Haslam, S. A., Jetten, J., Postmes, T., & Haslam, C. (2008). Social Identity, Health and Well-Being: An Emerging Agenda for Applied Psychology. *Applied Psychology*, *58*(1), 1-23. https://doi.org/10.1111/j.1464-0597.2008.00379.x

Häusser, J. A., Junker, N. M., & Dick, R. (2020). The how and the when of the social cure: A conceptual model of group- and individual-level mechanisms linking social identity to health and well-being. *European Journal of Social Psychology*, *50*(4), 721-732. https://doi.org/10.1002/ejsp.2668

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: a theoretical and empirical review of consequences and mechanisms. *Ann Behav Med*, *40*(2), 218-227. https://doi.org/10.1007/s12160-010-9210-8

Hayes, S. A., & Watson, S. L. (2013). The impact of parenting stress: a meta-analysis of studies comparing the experience of parenting stress in parents of children with and without autism spectrum disorder. *J Autism Dev Disord*, *43*(3), 629-642. https://doi.org/10.1007/s10803-012-1604-y

Heiman, T., & Berger, O. (2008). Parents of children with Asperger syndrome or with learning disabilities: Family environment and social support. *Research in Developmental Disabilities*, *29*(4), 289-300.

Higgins, J. P., Savović, J., Page, M. J., Elbers, R. G., & Sterne, J. A. (2019). Assessing risk of bias in a randomized trial. *Cochrane handbook for systematic reviews of interventions*, 205-228.

Holt-Lunstad, J., Robles, T. F., & Sbarra, D. A. (2017). Advancing social connection as a public health priority in the United States. *Am Psychol*, *72*(6), 517-530. https://doi.org/10.1037/amp0000103

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: a meta-analytic review. *PLoS Med*, *7*(7), e1000316. https://doi.org/10.1371/journal.pmed.1000316

Holtz, B., Smock, A., & Reyes-Gastelum, D. (2015). Connected Motherhood: Social Support for Moms and Moms-to-Be on Facebook. *Telemed J E Health*, *21*(5), 415-421. https://doi.org/10.1089/tmj.2014.0118

Holtz, B. E., Mitchell, K. M., Nuttall, A. K., Cotten, S. R., Hershey, D. D., Dunneback, J. K., & Wood, M. A. (2020). Using User-Feedback to Develop a Website: MyT1DHope, for Parents of Children with T1D. *Health Commun*, *35*(3), 281-288. https://doi.org/10.1080/10410236.2018.1560579

Hoybye, M. T., Johansen, C., & Tjornhoj-Thomsen, T. (2005). Online interaction. Effects of storytelling in an internet breast cancer support group. *Psychooncology*, *14*(3), 211-220. https://doi.org/10.1002/pon.837

Huang, R., Yan, C., Tian, Y., Lei, B., Yang, D., Liu, D., & Lei, J. (2020). Effectiveness of peer support intervention on perinatal depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, *276*, 788-796.

Hughes, R. A., Heron, J., Sterne, J. A., & Tilling, K. (2019). Accounting for missing data in statistical analyses: multiple imputation is not always the answer. *International journal of epidemiology*, *48*(4), 1294-1304.

Hyland, P., Shevlin, M., Murphy, J., McBride, O., Fox, R., Bondjers, K., Karatzias, T., Bentall, R. P., Martinez, A., & Vallières, F. (2021). A longitudinal assessment of depression and anxiety in the Republic of Ireland before and during the COVID-19 pandemic. *Psychiatry Research*, *300*, 113905.

Iacobucci, D., Schneider, M. J., Popovich, D. L., & Bakamitsos, G. A. (2017). Mean centering, multicollinearity, and moderators in multiple regression: The reconciliation redux. *Behavior research methods*, *49*(1), 403-404.

Ihrig, A., Karschuck, P., Haun, M. W., Thomas, C., & Huber, J. (2020). Online peer-to-peer support for persons affected by prostate cancer: a systematic review. *Patient Education and Counseling*, *103*(10), 2107-2115.

Ireys, H. T., Chernoff, R., DeVet, K. A., & Kim, Y. (2001). Maternal outcomes of a randomized controlled trial of a community-based support program for families of children with chronic illnesses. *Archives of pediatrics & adolescent medicine*, *155*(7), 771-777.

Iyer, A., Jetten, J., Tsivrikos, D., Postmes, T., & Haslam, S. A. (2009). The more (and the more compatible) the merrier: multiple group memberships and identity compatibility as predictors of adjustment after life transitions. *Br J Soc Psychol*, *48*(Pt 4), 707-733. https://doi.org/10.1348/014466608X397628

Jeste, D. V., Lee, E. E., & Cacioppo, S. (2020). Battling the Modern Behavioral Epidemic of Loneliness: Suggestions for Research and Interventions. *JAMA Psychiatry*, *77*(6), 553-554. https://doi.org/10.1001/jamapsychiatry.2020.0027

Jetten, J., Branscombe, N. R., Haslam, S. A., Haslam, C., Cruwys, T., Jones, J. M., Cui, L., Dingle, G., Liu, J., Murphy, S. C., Thai, A., Walter, Z., & Zhang, A. (2015). Having a lot of a good thing: multiple important group memberships as a source of self-esteem. *PLoS One*, *10*(5), e0124609. https://doi.org/10.1371/journal.pone.0124609

Jetten, J., Haslam, S. A., Cruwys, T., Greenaway, K. H., Haslam, C., & Steffens, N. K. (2017). Advancing the social identity approach to health and well-being: Progressing the social cure research agenda. *European Journal of Social Psychology*, *47*(7), 789-802. https://doi.org/10.1002/ejsp.2333

Johnston, C., & Mash, E. J. (1989). A Measure of Parenting Satisfaction and Efficacy. *Journal of Clinical Child Psychology*, *18*(2), 167-175. https://doi.org/10.1207/s15374424jccp1802_8

Jones, C. C., Jomeen, J., & Hayter, M. (2014). The impact of peer support in the context of perinatal mental illness: A meta-ethnography. *Midwifery*, *30*(5), 491-498.

Junttila, N., Ahlqvist-Bjorkroth, S., Aromaa, M., Rautava, P., Piha, J., & Raiha, H. (2015). Intercorrelations and developmental pathways of mothers' and fathers' loneliness during pregnancy, infancy and toddlerhood--STEPS study. *Scand J Psychol*, *56*(5), 482-488. https://doi.org/10.1111/sjop.12241

Kamis, C. (2021). The Long-Term Impact of Parental Mental Health on Children's Distress Trajectories in Adulthood. *Soc Ment Health*, *11*(1), 54-68. https://doi.org/10.1177/2156869320912520

Karlsson, P., & Bergmark, A. (2015). Compared with what? An analysis of control-group types in Cochrane and Campbell reviews of psychosocial treatment efficacy with substance use disorders. *Addiction*, *110*(3), 420-428. https://doi.org/10.1111/add.12799

Keim, S. A., Daniels, J. L., Dole, N., Herring, A. H., Siega-Riz, A. M., & Scheidt, P. C. (2011). A prospective study of maternal anxiety, perceived stress, and depressive symptoms in relation to infant cognitive development. *Early Hum Dev*, *87*(5), 373-380. https://doi.org/10.1016/j.earlhumdev.2011.02.004

Kemp, S. (2022, January 26). *Digital 2022: Global Overview Report.* Data Reportal. https://datareportal.com/reports/digital-2022-global-overview-report

Kerr, S. M., & McIntosh, J. (2000). Coping when a child has a disability: exploring the impact of parent-to-parent support. *Child: Care, Health and Development*, *26*(4), 309-322.

Kingsnorth, S., Gall, C., Beayni, S., & Rigby, P. (2011). Parents as transition experts? Qualitative findings from a pilot parent-led peer support group. *Child Care Health Dev*, *37*(6), 833-840. https://doi.org/10.1111/j.1365-2214.2011.01294.x

Kosugi, K., Nishiguchi, Y., Miura, T., Fujisawa, D., Kawaguchi, T., Izumi, K., Takehana, J., Uehara, Y., Usui, Y., Terada, T., Inoue, Y., Natsume, M., Yajima, M. Y., Watanabe, Y. S., Okizaki, A., Matsushima, E., & Matsumoto, Y. (2021). Association Between Loneliness and the Frequency of Using Online Peer Support Groups Among Cancer Patients With Minor Children: A Cross-Sectional Web-Based Study. *J Pain Symptom Manage*, *61*(5), 955-962. https://doi.org/10.1016/j.jpainsymman.2020.09.035

Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: a new depression diagnostic and severity measure. In (Vol. 32, pp. 509-515): SLACK Incorporated Thorofare, NJ.

Kruse, J. A., Williams, R. A., & Seng, J. S. (2014). Considering a Relational Model for Depression in Women with Postpartum Depression. *Int J Childbirth*, *4*(3), 151-168. https://doi.org/10.1891/2156-5287.4.3.151

Lai, D. W. L., Li, J., Ou, X., & Li, C. Y. P. (2020). Effectiveness of a peer-based intervention on loneliness and social isolation of older Chinese immigrants in Canada: a randomized controlled trial. *BMC Geriatr*, *20*(1), 356. https://doi.org/10.1186/s12877-020-01756-9

Lasgaard, M., Friis, K., & Shevlin, M. (2016). "Where are all the lonely people?" A population-based study of high-risk groups across the life span. *Soc Psychiatry Psychiatr Epidemiol*, *51*(10), 1373-1384. https://doi.org/10.1007/s00127-016-1279-3

Law, M., King, S., Stewart, D., & King, G. (2002). The perceived effects of parent-led support groups for parents of children with disabilities. *Physical & Occupational Therapy in Pediatrics*, *21*(2-3), 29-48.

Lawrence, P. J., Murayama, K., & Creswell, C. (2019). Systematic review and meta-analysis: anxiety and depressive disorders in offspring of parents with anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *58*(1), 46-60.

Leach, L. S., Poyser, C., Cooklin, A. R., & Giallo, R. (2016). Prevalence and course of anxiety disorders (and symptom levels) in men across the perinatal period: A systematic review. *J Affect Disord*, *190*, 675-686. https://doi.org/10.1016/j.jad.2015.09.063

Lee, C. M., Cadigan, J. M., & Rhew, I. C. (2020). Increases in Loneliness Among Young Adults During the COVID-19 Pandemic and Association With Increases in Mental Health Problems. *J Adolesc Health*, *67*(5), 714-717. https://doi.org/10.1016/j.jadohealth.2020.08.009

Lévesque, S., Bisson, V., Charton, L., & Fernet, M. (2020). Parenting and Relational Well-being During the Transition to Parenthood: Challenges for First-time Parents. *Journal of Child and Family Studies*, *29*(7), 1938-1956. https://doi.org/10.1007/s10826-020-01727-z

Levy, A., Midgley, A., Pilsworth, S., Mcgonigle, A., Wigelsworth, L., Jones, L., Wat, D., Pott, N., Bettany, M., & Matata, B. (2019). Applying the Social Identity Approach to Public Health. A Case Example of Theory in Practice. *The European Health Psychologist*, *21*(1), 595-601.

Lima, M. L., Marques, S., Muiños, G., & Camilo, C. (2017). All you need is Facebook friends? Associations between online and face-to-face friendships and health. *Frontiers in Psychology*, *8*, 68.

Lincoln, K. D., & Chae, D. H. (2012). Emotional support, negative interaction and major depressive disorder among African Americans and Caribbean Blacks: findings from the National Survey of American Life. *Soc Psychiatry Psychiatr Epidemiol*, *47*(3), 361-372. https://doi.org/10.1007/s00127-011-0347-y

Linden, K., Berg, M., Adolfsson, A., & Sparud-Lundin, C. (2018). Person-centred, web-based support in pregnancy and early motherhood for women with Type 1 diabetes mellitus: a randomized controlled trial. *Diabet Med*, *35*(2), 232-241. https://doi.org/10.1111/dme.13552

Lindgren, A., Barber, J. P., & Sandahl, C. (2008). Alliance to the group-as-a-whole as a predictor of outcome in psychodynamic group therapy. *Int J Group Psychother*, *58*(2), 163-184. https://doi.org/10.1521/ijgp.2008.58.2.163

Lloyd-Evans, B., Mayo-Wilson, E., Harrison, B., Istead, H., Brown, E., Pilling, S., Johnson, S., & Kendall, T. (2014). A systematic review and meta-analysis of randomised controlled trials of peer support for people with severe mental illness. *BMC Psychiatry*, *14*(1), 1-12.

Loades, E. e. a. (2020). Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19.

Love, S. M., Sanders, M. R., Turner, K. M., Maurange, M., Knott, T., Prinz, R., Metzler, C., & Ainsworth, A. T. (2016). Social media and gamification: Engaging vulnerable parents in an online evidence-based parenting program. *Child Abuse Negl*, *53*, 95-107. https://doi.org/10.1016/j.chiabu.2015.10.031

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck

Depression and Anxiety Inventories. *Behav Res Ther*, *33*(3), 335-343. https://doi.org/10.1016/0005-7967(94)00075-u

Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Medical care*, 266-274.

Luoma, I., Korhonen, M., Puura, K., & Salmelin, R. K. (2019). Maternal loneliness: concurrent and longitudinal associations with depressive symptoms and child adjustment. *Psychol Health Med*, *24*(6), 667-679. https://doi.org/10.1080/13548506.2018.1554251

Luoma, I., Korhonen, M., Salmelin, R. K., Helminen, M., & Tamminen, T. (2015). Long-term trajectories of maternal depressive symptoms and their antenatal predictors. *Journal of Affective Disorders*, *170*, 30-38.

Luthar, S. S., & Ciciolla, L. (2015). Who mothers mommy? Factors that contribute to mothers' well-being. *Dev Psychol*, *51*(12), 1812-1823. https://doi.org/10.1037/dev0000051

Marinucci, M., Pancani, L., Aureli, N., & Riva, P. (2022). Online social connections as surrogates of face-to-face interactions: A longitudinal study under Covid-19 isolation. *Computers in Human Behavior*, *128*, 107102.

Martin, S., Roderick, M. C., Lockridge, R., Toledo-Tamula, M. A., Baldwin, A., Knight, P., & Wolters, P. (2017). Feasibility and Preliminary Efficacy of an Internet Support Group for Parents of a Child with Neurofibromatosis Type 1: a Pilot Study. *J Genet Couns*, *26*(3), 576-585. https://doi.org/10.1007/s10897-016-0031-1

Masi, C. M., Chen, H. Y., Hawkley, L. C., & Cacioppo, J. T. (2011). A meta-analysis of interventions to reduce loneliness. *Pers Soc Psychol Rev*, *15*(3), 219-266. https://doi.org/10.1177/1088868310377394

McDaniel, B. T., Coyne, S. M., & Holmes, E. K. (2012). New mothers and media use: associations between blogging, social networking, and maternal well-being. *Matern Child Health J*, *16*(7), 1509-1517. https://doi.org/10.1007/s10995-011-0918-2

McKeon, G., Palmer, E. E., Macintosh, R., Nevin, S. M., Wheatley, L., & Rosenbaum, S. (2021). Feasibility of a mental health informed physical activity intervention for the carers of children with developmental and epileptic encephalopathy. *Epilepsy Behav*, *121*(Pt A), 108022. https://doi.org/10.1016/j.yebeh.2021.108022

McNamara, N., Stevenson, C., Costa, S., Bowe, M., Wakefield, J., Kellezi, B., Wilson, I., Halder, M., & Mair, E. (2021). Community identification, social support, and loneliness: The benefits of social identification for personal well-being. *British Journal of Social Psychology*, *60*(4), 1379-1402.

Mead. (2001). Peer Support: A Theoretical Perspective. *Psychiatric rehabilitation journal*, *25*(2), 134.

Mead, S., & MacNeil, C. (2006). Peer support: What makes it unique. *International Journal of Psychosocial Rehabilitation*, *10*(2), 29-37.

Melrose, S. (2010). Paternal postpartum depression: how can nurses begin to help? *Contemp Nurse*, *34*(2), 199-210. https://doi.org/10.5172/conu.2010.34.2.199

Mensah, F. K., & Kiernan, K. E. (2010). Parents’ mental health and children’s cognitive and social development. *Social Psychiatry and Psychiatric Epidemiology*, *45*(11), 1023-1035.

Merchant, R., Goldin, A., Manjanatha, D., Harter, C., Chandler, J., Lipp, A., Nguyen, T., & Naslund, J. A. (2022). Opportunities to expand access to mental health services: A case for the role of online peer support communities. *Psychiatr Q*, *93*(2), 613-625. https://doi.org/10.1007/s11126-022-09974-7

Metsäpelto, R.-L., Pakarinen, E., Kiuru, N., Poikkeus, A.-M., Lerkkanen, M.-K., & Nurmi, J.-E. (2015). Developmental dynamics between children's externalizing problems, task-avoidant behavior, and academic performance in early school years: A 4-year follow-up. *Journal of Educational Psychology*, *107*(1), 246-257. https://doi.org/10.1037/a0037389

Meyers, N., Glick, A. F., Mendelsohn, A. L., Parker, R. M., Sanders, L. M., Wolf, M. S., Bailey, S., Dreyer, B. P., Velazquez, J. J., & Yin, H. S. (2020). Parents' use of technologies for health management: A health literacy perspective. *Academic pediatrics*, *20*(1), 23-30.

Miller, J. J., Cooley, M., Niu, C., Segress, M., Fletcher, J., Bowman, K., & Littrell, L. (2019). Support, information seeking, and homophily in a virtual support group for adoptive parents: Impact on perceived empathy. *Children and Youth Services Review*, *101*, 151-156. https://doi.org/10.1016/j.childyouth.2019.03.047

Miyamoto, Y., & Sono, T. (2012). Lessons from peer support among individuals with mental health difficulties: a review of the literature. *Clinical practice and epidemiology in mental health: CP & EMH*, *8*, 22.

Mo, P. K., & Coulson, N. S. (2013). Online support group use and psychological health for individuals living with HIV/AIDS. *Patient Educ Couns*, *93*(3), 426-432. https://doi.org/10.1016/j.pec.2013.04.004

Moon, R. Y., Mathews, A., Oden, R., & Carlin, R. (2019). Mothers' perceptions of the Internet and social media as sources of parenting and health information: Qualitative study. *Journal of Medical Internet Research*, *21*(7). https://doi.org/10.2196/14289

Morawska, A., Sanders, M. R., Haslam, D., Filus, A., & Fletcher, R. (2014). Child Adjustment and Parent Efficacy Scale: Development and Initial Validation of a Parent

Report Measure. *Australian Psychologist*, *49*(4), 241-252. https://doi.org/10.1111/ap.12057

Morie, J. F., & Chance, E. (2011). Extending the reach of health care for obesity and diabetes using virtual worlds. *J Diabetes Sci Technol*, *5*(2), 272-276. https://doi.org/10.1177/193229681100500211

Morse, H., & Brown, A. (2021). Accessing local support online: Mothers' experiences of local Breastfeeding Support Facebook groups. *Matern Child Nutr*, *17*(4), e13227. https://doi.org/10.1111/mcn.13227

Muldoon, O. T., Lowe, R. D., Jetten, J., Cruwys, T., & Haslam, S. A. (2021). Personal and Political: Post-Traumatic Stress Through the Lens of Social Identity, Power, and Politics. *Polit Psychol*, *42*(3), 501-533. https://doi.org/10.1111/pops.12709

Mumsnet. (n.d.). *About Us.* Mumsnet. https://www.mumsnet.com/i/about-us

Murphy, C., Thorpe, L., Trefusis, H., & Kousoulis, A. (2020). Unlocking the potential for digital mental health technologies in the UK: a Delphi exercise. *BJPsych Open*, *6*(1), e12. https://doi.org/10.1192/bjo.2019.95

National Advisory Council for Online Safety (NACOS). (2021, November 17). *Report of a National Survey of Children, their Parents and Adults regarding Online Safety.* Gov.ie. https://www.gov.ie/en/publication/ebe58-national-advisory-council-for-online-safety-nacos/

National Telecommunications and Information Administration. (2011, February). *Digital Nation, Expanding Internet Usage.* https://ntia.doc.gov/files/ntia/publications/ntia_internet_use_report_february_2011.pdf

Naicker, K., Wickham, M., & Colman, I. (2012). Timing of first exposure to maternal depression and adolescent emotional disorder in a national Canadian cohort. *PLoS One*, *7*(3), e33422. https://doi.org/10.1371/journal.pone.0033422

Ng, L., Amatya, B., & Khan, F. (2013). Outcomes of a peer support program in multiple sclerosis in an Australian community cohort: a prospective study. *Journal of Neurodegenerative Diseases*, *2013*.

Nicholas, D. B., & Keilty, K. (2007). An evaluation of dyadic peer support for caregiving parents of children with chronic lung disease requiring technology assistance. *Social Work in Health Care*, *44*(3), 245-259.

Nicholson, J. M., Berthelsen, D., Williams, K. E., & Abad, V. (2010). National study of an early parenting intervention: implementation differences on parent and child outcomes: parenting program implementation. *Prev Sci*, *11*(4), 360-370. https://doi.org/10.1007/s11121-010-0181-6

Nicholson, N. R. (2012). A review of social isolation: an important but underassessed condition in older adults. *J Prim Prev*, *33*(2-3), 137-152. https://doi.org/10.1007/s10935-012-0271-2

Niela-Vilén, H., Axelin, A., Salanterä, S., & Melender, H.-L. (2014). Internet-based peer support for parents: A systematic integrative review. *International Journal of Nursing Studies*, *51*(11), 1524-1537. https://doi.org/10.1016/j.ijnurstu.2014.06.009

Nieuwboer, C. C., Fukkink, R. G., & Hermanns, J. M. (2013). Peer and professional parenting support on the Internet: a systematic review. *Cyberpsychol Behav Soc Netw*, *16*(7), 518-528. https://doi.org/10.1089/cyber.2012.0547

Nolan, S., Hendricks, J., & Towell, A. (2015). Social networking sites (SNS); exploring their uses and associated value for adolescent mothers in Western Australia in terms of social support provision and building social capital. *Midwifery*, *31*(9), 912-919. https://doi.org/10.1016/j.midw.2015.05.002

Nowland, R., Thomson, G., McNally, L., Smith, T., & Whittaker, K. (2021). Experiencing loneliness in parenthood: a scoping review. *Perspect Public Health*, *141*(4), 214-225. https://doi.org/10.1177/17579139211018243

O'Connor, E. E., & Langer, D. A. (2019). I heard it through the grapevine: Where and what parents learn about youth mental health treatments. *J Clin Psychol*, *75*(4), 710-725. https://doi.org/10.1002/jclp.22706

O'Connor, H., & Madge, C. (2004). 'My Mum's Thirty Years Out Of Date'. *Community, Work & Family*, *7*(3), 351-369. https://doi.org/10.1080/1366880042000295754

Office for National Statistics. (2018, April 10). *Loneliness – What Characteristics and Circumstances are Associated with Feeling Lonely.* Office for National Statistics, https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/lonelinesswhatcharacteristicsandcircumstancesareassociatedwithfeelinglonely/2018-04-10

Office for National Statistics. (2021, April 6). *Internet Users, UK: 2020. Internet use in the UK; annual estimates by age, sex, disability and geographical location.* Office for National Statistics. https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2020

O'Toole, B., Burton, M., Rothwell, A., Outram, S., Dadds, M., & Catts, S. (2017). Intergenerational transmission of post-traumatic stress disorder in Australian Vietnam veterans' families. *Acta Psychiatrica Scandinavica*, *135*(5), 363-372.

Oakley, A., Rajan, L., & Turner, H. (1998). Evaluating parent support initiatives: lessons from two case studies. *Health & Social Care in the Community*, *6*(5), 318-330.

Ong, A. D., Uchino, B. N., & Wethington, E. (2016). Loneliness and Health in Older Adults: A Mini-Review and Synthesis. *Gerontology*, *62*(4), 443-449. https://doi.org/10.1159/000441651

Ørmen, J., Helles, R., & Jensen, K. B. (2021). The social uses of the Internet: Introduction to the special section. *New Media & Society*, *23*(7), 1739-1750. https://doi.org/10.1177/14614448211015978

Ortiz-Ospina, E., & Roser, M. (2020). Loneliness and social connections. *Our World in Data*.

Otchet, F., Carey, M. S., & Adam, L. (1999). General health and psychological symptom status in pregnancy and the puerperium: what is normal? *Obstetrics & Gynecology*, *94*(6), 935-941.

Palit, A., & Chatterjee, A. K. (2006). Parent-to-parent counseling–a gateway for developing positive mental health for the parents of children that have cerebral palsy with multiple disabilities. *International Journal of Rehabilitation Research*, *29*(4), 281-288.

Panchal, N., Kamal, R., Orgera, K., Cox, C., Garfield, R., Hamel, L., & Chidambaram, P. (2020). The implications of COVID-19 for mental health and substance use. *Kaiser family foundation*, *21*.

Panula, V., Junttila, N., Aromaa, M., Rautava, P., & Räihä, H. (2020). Parental Psychosocial Well-Being as a Predictor of the Social Competence of a Child. *Journal of Child and Family Studies*, *29*(11), 3004-3019. https://doi.org/10.1007/s10826-020-01790-6

Parsons, S., Lewis, A., & Ellins, J. (2009). The views and experiences of parents of children with autistic spectrum disorder about educational provision: comparisons with parents of children with other disabilities from an online survey. *European Journal of Special Needs Education*, *24*(1), 37-58.

Paulson. (2010). Prenatal and Postpartum Depression in Fathers and Its Association With Maternal Depression.

Pehora, C., Gajaria, N., Stoute, M., Fracassa, S., Serebale-O'Sullivan, R., & Matava, C. T. (2015). Are parents getting it right? A survey of parents' internet use for children's health care information. *Interactive journal of medical research*, *4*(2), e3790.

Perkins, J. M., Subramanian, S. V., & Christakis, N. A. (2015). Social networks and health: a systematic review of sociocentric network studies in low- and middle-income countries. *Soc Sci Med*, *125*, 60-78. https://doi.org/10.1016/j.socscimed.2014.08.019

Perlman, D., & Peplau, L. A. (1981). *Toward a social psychology of loneliness. Personal relationships* (Vol. 3). Academic Press.

Pfeiffer, P. N., Heisler, M., Piette, J. D., Rogers, M. A., & Valenstein, M. (2011). Efficacy of peer support interventions for depression: a meta-analysis. *General hospital psychiatry*, *33*(1), 29-36.

Philpott, L. F., Leahy-Warren, P., FitzGerald, S., & Savage, E. (2017). Stress in fathers in the perinatal period: A systematic review. *Midwifery*, *55*, 113-127. https://doi.org/10.1016/j.midw.2017.09.016

Pidgeon, A., & Sanders, M. (2002). Parent's attributions of child behavior measure. *Unpublished manuscript, The University of Queensland*.

Plantin, L., & Daneback, K. (2009). Parenthood, information and support on the internet. A literature review of research on parents and professionals online. *BMC Fam Pract*, *10*, 34. https://doi.org/10.1186/1471-2296-10-34

Postmes, T., Haslam, S. A., & Jans, L. (2013). A single-item measure of social identification: reliability, validity, and utility. *Br J Soc Psychol*, *52*(4), 597-617. https://doi.org/10.1111/bjso.12006

Postmes, T., Wichmann, L. J., van Valkengoed, A. M., & van der Hoef, H. (2019). Social identification and depression: A meta-analysis. *European Journal of Social Psychology*, *49*(1), 110-126. https://doi.org/10.1002/ejsp.2508

Pote, H., Rees, A., Holloway-Biddle, C., & Griffith, E. (2021). Workforce challenges in digital health implementation: How are clinical psychology training programmes developing digital competences? *Digit Health*, *7*, 2055207620985396. https://doi.org/10.1177/2055207620985396

Preece, J., Maloney-Krichmar, D., & Abras, C. (2003). History of online communities. *Encyclopedia of community*, *3*(1023-1027), 86.

Prenoveau, J. M., Craske, M. G., West, V., Giannakakis, A., Zioga, M., Lehtonen, A., Davies, B., Netsi, E., Cardy, J., Cooper, P., Murray, L., & Stein, A. (2017). Maternal postnatal depression and anxiety and their association with child emotional negativity and behavior problems at two years. *Dev Psychol*, *53*(1), 50-62. https://doi.org/10.1037/dev0000221

Prescott, J., Hanley, T., & Ujhelyi, K. (2017). Peer Communication in Online Mental Health Forums for Young People: Directional and Nondirectional Support. *JMIR Ment Health*, *4*(3), e29. https://doi.org/10.2196/mental.6921

Prescott, J., Rathbone, A. L., & Brown, G. (2020). Online peer to peer support: Qualitative analysis of UK and US open mental health Facebook groups. *Digital Health*, *6*, 2055207620979209.

Pretorius, K., Johnson, K. E., & Rew, L. (2019). An integrative review: Understanding parental use of social media to influence infant and child health. *Maternal and Child Health Journal*, *23*(10), 1360-1370. https://doi.org/10.1007/s10995-019-02781-w

Preyde, M., & Ardal, F. (2003). Effectiveness of a parent "buddy" program for mothers of very preterm infants in a neonatal intensive care unit. *Cmaj*, *168*(8), 969-973.

Putnick, D. L., Bornstein, M. H., Hendricks, C., Painter, K. M., Suwalsky, J. T., & Collins, W. A. (2010). Stability, Continuity, and Similarity of Parenting Stress in European American Mothers and Fathers across their Child's Transition to Adolescence. *Parent Sci Pract*, *10*(1), 60-77. https://doi.org/10.1080/15295190903014638

Ramchandani, P., Stein, A., Evans, J., & O'Connor, T. G. (2005). Paternal depression in the postnatal period and child development: a prospective population study. *The Lancet*, *365*(9478), 2201-2205. https://doi.org/10.1016/s0140-6736(05)66778-5

Rearick, E. M., Sullivan-Bolyai, S., Bova, C., & Knafl, K. A. (2011). Parents of children newly diagnosed with type 1 diabetes: experiences with social support and family management. *The Diabetes Educator*, *37*(4), 508-518.

Resendez, M. G., Quist, R. M., & Matshazi, D. G. (2000). A longitudinal analysis of family empowerment and client outcomes. *Journal of Child and Family Studies*, *9*(4), 449-460.

Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological methods*, *17*(3), 354.

Robb, C. E., de Jager, C. A., Ahmadi-Abhari, S., Giannakopoulou, P., Udeh-Momoh, C., McKeand, J., Price, G., Car, J., Majeed, A., Ward, H., & Middleton, L. (2020). Associations of Social Isolation with Anxiety and Depression During the Early COVID-19 Pandemic: A Survey of Older Adults in London, UK. *Front Psychiatry*, *11*, 591120. https://doi.org/10.3389/fpsyt.2020.591120

Rollercoaster. (2022, April). *Rollercoaster Evaluation Briefing Paper.* Charlie Waller. https://charliewaller.org/parent-peer-support-workers/rollercoaster-evaluation-briefing-paper

Rossman, B. (2007). Breastfeeding peer counselors in the United States: helping to build a culture and tradition of breastfeeding. *J Midwifery Womens Health*, *52*(6), 631-637. https://doi.org/10.1016/j.jmwh.2007.05.006

Royal College of Psychiatrists. (2015). *Parental Mental Health: the impact on children and adolescents: for parents and carers.* Royal College of Psychiatrists. https://www.rcpsych.ac.uk/mental-health/parents-and-young-people/information-for-parents-and-carers/parental-mental-illness-the-impact-on-children-and-adolescents-for-parents-and-carers

Rubertsson, C., Pallant, J. F., Sydsjö, G., Haines, H. M., & Hildingsson, I. (2014). Maternal depressive symptoms have a negative impact on prenatal attachment – findings from a Swedish community sample. *Journal of Reproductive and Infant Psychology*, *33*(2), 153-164. https://doi.org/10.1080/02646838.2014.992009

Rus-Calafell, M., Gutiérrez-Maldonado, J., & Ribas-Sabaté, J. (2014). A virtual reality-integrated program for improving social skills in patients with schizophrenia: a pilot study. *J Behav Ther Exp Psychiatry*, *45*(1), 81-89. https://doi.org/10.1016/j.jbtep.2013.09.002

Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of personality assessment*, *66*(1), 20-40.

Ryan, J., Lopian, L., Le, B., Edney, S., Van Kessel, G., Plotnikoff, R., Vandelanotte, C., Olds, T., & Maher, C. (2019). It's not raining men: a mixed-methods study investigating methods of improving male recruitment to health behaviour research. *BMC Public Health*, *19*(1), 1-9.

Sadat, Z., Abedzadeh-Kalahroudi, M., Kafaei Atrian, M., Karimian, Z., & Sooki, Z. (2014). The Impact of Postpartum Depression on Quality of Life in Women After Child's Birth. *Iran Red Crescent Med J*, *16*(2), e14995. https://doi.org/10.5812/ircmj.14995

Saha, S. K., Prakash, A., & Majumder, M. (2019). “Similar query was answered earlier”: processing of patient authored text for retrieving relevant contents from health discussion forum. *Health Information Science and Systems*, *7*(1), 1-9.

Sani, F., Herrera, M., Wakefield, J. R., Boroch, O., & Gulyas, C. (2012). Comparing social contact and group identification as predictors of mental health. *Br J Soc Psychol*, *51*(4), 781-790. https://doi.org/10.1111/j.2044-8309.2012.02101.x

Sartore, G. M., Pourliakas, A., & Lagioia, V. (2021). Peer support interventions for parents and carers of children with complex needs. *Cochrane Database Syst Rev*, *12*, CD010618. https://doi.org/10.1002/14651858.CD010618.pub2

Sawyer, A., Kaim, A., Le, H.-N., McDonald, D., Mittinty, M., Lynch, J., & Sawyer, M. (2019). The effectiveness of an app-based nurse-moderated program for new mothers with depression and parenting problems (eMums plus): Pragmatic randomized controlled trial. *Journal of Medical Internet Research*, *21*(6). https://doi.org/10.2196/13689

Scharer, K. (2005). Internet social support for parents: the state of science. *J Child Adolesc Psychiatr Nurs*, *18*(1), 26-35. https://doi.org/10.1111/j.1744-6171.2005.00007.x

Shankar, A., Rafnsson, S. B., & Steptoe, A. (2015). Longitudinal associations between social connections and subjective wellbeing in the English Longitudinal Study of Ageing. *Psychol Health*, *30*(6), 686-698. https://doi.org/10.1080/08870446.2014.979823

Shaw, L. H., & Gant, L. M. (2002). Users divided? Exploring the gender gap in Internet use. *CyberPsychology & Behavior*, *5*(6), 517-527.

Shilling, V., Morris, C., Thompson-Coon, J., Ukoumunne, O., Rogers, M., & Logan, S. (2013). Peer support for parents of children with chronic disabling conditions: a systematic review of quantitative and qualitative studies. *Dev Med Child Neurol*, *55*(7), 602-609. https://doi.org/10.1111/dmcn.12091

Shorey, S., Ang, L., Goh, E. C. L., & Lopez, V. (2019). Paternal involvement of Singaporean fathers within six months postpartum: A follow-up qualitative study. *Midwifery*, *70*, 7-14. https://doi.org/10.1016/j.midw.2018.12.003

Sjöberg, L., Östling, S., Falk, H., Sundh, V., Waern, M., & Skoog, I. (2013). Secular changes in the relation between social factors and depression: a study of two birth cohorts of Swedish septuagenarians followed for 5 years. *J Affect Disord*, *150*(2), 245-252. https://doi.org/10.1016/j.jad.2013.04.002

Slade, M. (2002). What outcomes to measure in routine mental health services, and how to assess them: a systematic review. *Aust N Z J Psychiatry*, *36*(6), 743-753. https://doi.org/10.1046/j.1440-1614.2002.01099.x

Smalbrugge, M., Jongenelis, L., Pot, A. M., Eefsting, J. A., Ribbe, M. W., & Beekman, A. T. (2006). Incidence and outcome of depressive symptoms in nursing home patients in the Netherlands. *The American Journal of Geriatric Psychiatry*, *14*(12), 1069-1076.

Smit, D., Vrijsen, J. N., Groeneweg, B., Vellinga-Dings, A., Peelen, J., & Spijker, J. (2021). A Newly Developed Online Peer Support Community for Depression (Depression Connect): Qualitative Study. *Journal of Medical Internet Research*, *23*(7), e25917.

Solomon, M., Pistrang, N., & Barker, C. (2001). The benefits of mutual support groups for parents of children with disabilities. *American Journal of Community Psychology*, *29*(1), 113-132.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, *166*(10), 1092-1097.

Sroufe, L. A. (2005). Attachment and development: a prospective, longitudinal study from birth to adulthood. *Attach Hum Dev*, *7*(4), 349-367. https://doi.org/10.1080/14616730500365928

Stednitz, J. N., & Epkins, C. C. (2006). Girls' and mothers' social anxiety, social skills, and loneliness: associations after accounting for depressive symptoms. *J Clin Child Adolesc Psychol*, *35*(1), 148-154. https://doi.org/10.1207/s15374424jccp3501_13

Steffens, N. K., LaRue, C. J., Haslam, C., Walter, Z. C., Cruwys, T., Munt, K. A., Haslam, S. A., Jetten, J., & Tarrant, M. (2021). Social identification-building interventions to improve health: A systematic review and meta-analysis. *Health psychology review*, *15*(1), 85-112.

Sterne, J. A., Savović, J., Page, M. J., Elbers, R. G., Blencowe, N. S., Boutron, I., Cates, C. J., Cheng, H.-Y., Corbett, M. S., & Eldridge, S. M. (2019). RoB 2: a revised tool for assessing risk of bias in randomised trials. *Bmj*, *366*.

Stessman, J., Rottenberg, Y., Shimshilashvili, I., Ein-Mor, E., & Jacobs, J. M. (2014). Loneliness, health, and longevity. *J Gerontol A Biol Sci Med Sci*, *69*(6), 744-750. https://doi.org/10.1093/gerona/glt147

Stickley, A., Koyanagi, A., Koposov, R., Schwab-Stone, M., & Ruchkin, V. (2014). Loneliness and health risk behaviours among Russian and U.S. adolescents: a cross-sectional study. *BMC Public Health*, *14*, 366. https://doi.org/10.1186/1471-2458-14-366

Strand, M., Eng, L. S., & Gammon, D. (2020). Combining online and offline peer support groups in community mental health care settings: a qualitative study of service users' experiences. *Int J Ment Health Syst*, *14*, 39. https://doi.org/10.1186/s13033-020-00370-x

Su, J., Dugas, M., Guo, X., & Gao, G. (2022). Building social identity-based groups to enhance online peer support for patients with chronic disease: a pilot study using mixed-methods evaluation. *Transl Behav Med*. https://doi.org/10.1093/tbm/ibac008

Sullivan-Bolyai, S., & Lee, M. M. (2011). Parent mentor perspectives on providing social support to empower parents. *The Diabetes Educator*, *37*(1), 35-43.

Suresh, R., Alam, A., & Karkossa, Z. (2021). Using Peer Support to Strengthen Mental Health During the COVID-19 Pandemic: A Review. *Front Psychiatry*, *12*, 714181. https://doi.org/10.3389/fpsyt.2021.714181

Surkalim, D. L., Luo, M., Eres, R., Gebel, K., van Buskirk, J., Bauman, A., & Ding, D. (2022). The prevalence of loneliness across 113 countries: systematic review and meta-analysis. *Bmj*, *376*, e067068. https://doi.org/10.1136/bmj-2021-067068

Tajfel, H., Turner, J. C., Austin, W. G., & Worchel, S. (1979). An integrative theory of intergroup conflict. *Organizational identity: A reader*, *56*(65), 9780203505984-9780203505916.

Talge, N. M., Neal, C., Glover, V., Early Stress, T. R., Prevention Science Network, F., Neonatal Experience on, C., & Adolescent Mental, H. (2007). Antenatal maternal stress and long-term effects on child neurodevelopment: how and why? *J Child Psychol Psychiatry*, *48*(3-4), 245-261. https://doi.org/10.1111/j.1469-7610.2006.01714.x

Teague, S. J., & Shatte, A. B. R. (2021). Peer support of fathers on Reddit: Quantifying the stressors, behaviors, and drivers. *Psychology of Men & Masculinities*, *22*(4), 757-766. https://doi.org/10.1037/men0000353

10.1037/men0000353.supp (Supplemental)

Thompson, D. M., Booth, L., Moore, D., & Mathers, J. (2022). Peer support for people with chronic conditions: a systematic review of reviews. *BMC Health Serv Res*, *22*(1), 427. https://doi.org/10.1186/s12913-022-07816-7

Tomasino, K. N., Lattie, E. G., Ho, J., Palac, H. L., Kaiser, S. M., & Mohr, D. C. (2017). Harnessing Peer Support in an Online Intervention for Older Adults with Depression.

Am J Geriatr Psychiatry, *25*(10), 1109-1119. https://doi.org/10.1016/j.jagp.2017.04.015

Tracy, K., & Wallace, S. P. (2016). Benefits of peer support groups in the treatment of addiction. *Subst Abuse Rehabil*, *7*, 143-154. https://doi.org/10.2147/SAR.S81535

Turner, J. C., & Reynolds, K. J. (1987). A self-categorization theory. *Rediscovering the social group: A self-categorization theory*.

van Uden-Kraan, C. F., Drossaert, C. H., Taal, E., Seydel, E. R., & van de Laar, M. A. (2008). Self-reported differences in empowerment between lurkers and posters in online patient support groups. *J Med Internet Res*, *10*(2), e18. https://doi.org/10.2196/jmir.992

von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Ann Intern Med*, *147*(8), 573-577. https://doi.org/10.7326/0003-4819-147-8-200710160-00010

Wakefield, C. E., Sansom-Daly, U. M., McGill, B. C., Ellis, S. J., Doolan, E. L., Robertson, E. G., Mathur, S., & Cohn, R. J. (2016). Acceptability and feasibility of an e-mental health intervention for parents of childhood cancer survivors: "Cascade". *Support Care Cancer*, *24*(6), 2685-2694. https://doi.org/10.1007/s00520-016-3077-6

Wang, J., Mann, F., Lloyd-Evans, B., Ma, R., & Johnson, S. (2018). Associations between loneliness and perceived social support and outcomes of mental health problems: a systematic review. *BMC Psychiatry*, *18*(1), 156. https://doi.org/10.1186/s12888-018-1736-5

Wang, X., Gao, L., Yang, J., Zhao, F., & Wang, P. (2020). Parental Phubbing and Adolescents' Depressive Symptoms: Self-Esteem and Perceived Social Support as

Moderators. *J Youth Adolesc*, *49*(2), 427-437. https://doi.org/10.1007/s10964-019-01185-x

Warr, P. (2022). How to Think About and Measure Psychological Well-being.

Weitzman. (2011). Paternal Depressive Symptoms and Child Behavioral or Emotional Problems in the United States.

Wigfield, A., Turner, R., Alden, S., Green, M., & Karania, V. K. (2020). Developing a New Conceptual Framework of Meaningful Interaction for Understanding Social Isolation and Loneliness. *Social Policy and Society*, *21*(2), 172-193. https://doi.org/10.1017/s147474642000055x

Wigfield, A., Turner, R., Alden, S., Green, M., & Karania, V. K. (2022). Developing a New Conceptual Framework of Meaningful Interaction for Understanding Social Isolation and Loneliness. *Social Policy and Society*, *21*(2), 172-193. https://doi.org/10.1017/S147474642000055X

Wilford, J. G., McCarty, R., Torno, L., Mucci, G., Torres-Eaton, N., Shen, V., & Loudon, W. (2020). A Multi-Modal Family Peer Support-Based Program to Improve Quality of Life among Pediatric Brain Tumor Patients: A Mixed-Methods Pilot Study. *Children (Basel)*, *7*(4). https://doi.org/10.3390/children7040035

Wilkerson, D. A., Gregory, V. L., Jr., & Kim, H. W. (2020). Online psychoeducation with parent management training: Examining the contribution of peer support. *Child & Family Social Work*, *25*(2), 448-459. https://doi.org/10.1111/cfs.12701

Woodman, A. C., Mawdsley, H. P., & Hauser-Cram, P. (2015). Parenting stress and child behavior problems within families of children with developmental disabilities: Transactional relations across 15 years. *Res Dev Disabil*, *36C*, 264-276. https://doi.org/10.1016/j.ridd.2014.10.011

World Health Organisation. (2019). Peer support groups by and for people with lived experience: *WHO QualityRights guidance module: module slides.* https://apps.who.int/iris/handle/10665/329644

Yamashita, A., Isumi, A., & Fujiwara, T. (2022). Online Peer Support and Well-being of Mothers and Children: Systematic Scoping Review. *J Epidemiol*, *32*(2), 61-68. https://doi.org/10.2188/jea.JE20200079

Yan, H., Ding, Y., & Guo, W. (2020). Mental Health of Pregnant and Postpartum Women During the Coronavirus Disease 2019 Pandemic: A Systematic Review and Meta-Analysis. *Front Psychol*, *11*, 617001. https://doi.org/10.3389/fpsyg.2020.617001

YoungMinds. (2019). *Three-quarters of Young People Seeking Mental Health Support Become More Unwell During Wait for Treatment – New Report.* https://www.youngminds.org.uk/media/5dilibjw/a-new-era-for-young-peoples-mental-health.pdf

Zagefka, H., Houston, D., Duff, L., & Moftizadeh, N. (2021). Combining Motherhood and Work: Effects of Dual Identity and Identity Conflict on Well-Being. *Journal of Child and Family Studies*, *30*(10), 2452-2460. https://doi.org/10.1007/s10826-021-02070-7

Zaidi, F., Nigam, A., Anjum, R., & Agarwalla, R. (2017). Postpartum depression in women: a risk factor analysis. *Journal of Clinical and Diagnostic Research: JCDR*, *11*(8), QC13.

Zelman, J. J., & Ferro, M. A. (2018). The parental stress scale: psychometric properties in families of children with chronic health conditions. *Family Relations*, *67*(2), 240-252.

Zimet, G. D., Powell, S. S., Farley, G. K., Werkman, S., & Berkoff, K. A. (1990). Psychometric characteristics of the multidimensional scale of perceived social support. *Journal of personality assessment*, *55*(3-4), 610-617.

Zingg, W., Castro-Sanchez, E., Secci, F., Edwards, R., Drumright, L., Sevdalis, N., & Holmes, A. (2016). Innovative tools for quality assessment: integrated quality criteria for review of multiple study designs (ICROMS). *Public Health*, *133*, 19-37.

Appendices

Appendix 1: Ethical Approval (RHUL)

From: **Ethics Application System** ethics@rhul.ac.uk
Subject: Result of your application to the Research Ethics Committee (application ID 2655)
Date: 30 June 2021 at 15:41
To: NHJT013@live.rhul.ac.uk, H.Pote@rhul.ac.uk, ethics@rhul.ac.uk

PI: Helen Pote
Project title: Use of Online Support Groups and Loneliness in Parents of Children with Mental Health Needs: An Investigation of Potential Moderators

REC ProjectID: 2655

Your application has been approved by the Research Ethics Committee.
Please report any subsequent changes that affect the ethics of the project to the University Research Ethics Committee ethics@rhul.ac.uk

Appendix 2: Study Advert Poster

Are you a parent of a <u>child who struggles to cope?</u>

Have you ever been on the internet for support or advice?

If so, we would like you invite you to participate in our **online survey** (takes roughly 20 minutes)

https://rhulpsychology.eu.qualtrics.com/jfe/form/SV_37NOVOxJ1fIqUGG

If you are interested, please visit the link above, scan the QR code or email elizabeth.hernandez.2019@live.rhul.ac.uk for more information:

PRIZE DRAW to win £50!

ROYAL
HOLLOWAY
UNIVERSITY
OF LONDON

Appendix 3: Demographic Questionnaire

1. How would you describe your gender?
    - Female
    - Male
    - Other
    - Prefer not to say

2. How old are you?
    - 18 – 24
    - 25 – 34
    - 35 – 44
    - 45 – 54
    - 55 – 64
    - 65+
    - Prefer not to answer

3. What is your ethnic group?

White Background
  - English, Welsh, Scottish, Northern Irish or British
  - Irish
  - Gypsy or Irish Traveller
  - Any other white background - please specify

Black/African/Caribbean/Black British
  - Africa
  - Caribbean
  - Any other Black/African/Caribbean background – please specify

Asian/Asian British
  - Indian
  - Pakistani
  - Bangladeshi
  - Chinese
  - Any other Asian Background – please specify

Mixed/Multiple ethnic groups
  - White and Black Caribbean
  - White and Black African
  - Any other mixed/multiple ethnic background – please specify

Other Ethnic group
  - Other – please specify

4. What is your marital status?
    - Single
    - Married
    - Civil Partnership
    - Divorced/Separated

- ○ Widowed
- ○ Co-habiting

5. Please describe your parenting status
  - ○ Co-parenting
  - ○ Lone parenting
  - ○ Parenting shared with extended family
  - ○ Other (please specify)

6. How many children do you have?

7. How old are your children? (Please enter in the format "Child 1: 8, Child 2: 13, etc...")

8. Are any of your children struggling at the moment? (e.g., anxiety, school difficulties, friendship problems etc.)

9. How many of your children are struggling?

10. How are they struggling? (Multiple answers can be selected)
  - ○ Anxiety
  - ○ Mood difficulties
  - ○ Struggles relating to a neurodevelopmental difficulty, such as Autism Spectrum Disorder or ADHD
  - ○ Self-harm
  - ○ School refusal
  - ○ Behaviour problems at school
  - ○ Difficulties relating to Obsessive Compulsive Disorder
  - ○ Physical health problem(s)
  - ○ Feeding/eating difficulties
  - ○ Friendship difficulties/bullying
  - ○ Other (please specify)

11. Are they **currently receiving** any external support for their difficulties? (e.g., through school, CAMHS etc.)
  - ○ Yes – all my children who need it are currently receiving support
  - ○ No – none of my children who need it are currently receiving support
  - ○ Some of my children who need it are currently receiving support, but some are not

12. Are they currently waiting to receive support for their difficulties?
  - ○ Yes – all of my children who need it are currently waiting to receive support
  - ○ No – none of my children who need it are currently waiting to receive support
  - ○ Some of my children who need it are currently waiting to receive support, but some are not
  - ○ Unsure

13. Please select the type of support they are currently or waiting to receive
  - ○ Child and Adolescent Mental Health Services

- ○ School (i.e., school counselling, support groups)
- ○ Online forum/support group
- ○ Other (please detail)

14. Are you current engaging in any parenting support?
    - ○ Yes
    - ○ No

15. Please select the type of parenting support
    - ○ Parenting skills group
    - ○ Post-diagnostic (e.g., Autism, ADHD) support group
    - ○ Other (please detail)

Appendix 4: Online Support Group Engagement Questionnaire

Many parents visit support forums on the internet to seek advice relating to their children or to connect with others in similar situations. We would like to ask you questions relating to your engagement with these internet support forums. We're interested in your experiences with either large forums, such as Mumsnet, other organisations such as Rollercoaster Parenting or Contact a Family or smaller support groups on social media that have been set up to support parents.

16. Are you a member of, or regularly visit, an internet support group/forum for parents (e.g., Mumsnet, Rollercoaster Parenting, Contact a Family, a Facebook group or other)?

- ○ Yes
- ○ Not currently
- ○ Never

17. Which internet support group/forum are you a member of or regularly visit?

18. How much time do you typically spend on an internet support group/forum in an average day?

- ○ Less than 10 minutes
- ○ 10 - 30 minutes
- ○ 30 - 60 minutes
- ○ More than 60 minutes

19. Have you ever posted any comments or questions to the internet support group/forum?

- ○ Yes, I have
- ○ No, never

20. How many posts, on average, do you write in the internet support group/forum on a typical week?

- ○ Zero
- ○ One – three
- ○ Four – six
- ○ Six or more

21. Would you identify as engaging in any other forms of parenting support, such as coffee mornings, parent WhatsApp groups etc.?

- ○ Yes (please specify)
- ○ Not currently
- ○ Never

Appendix 5: UCLA Loneliness Scale (Russell, 1996)

Please indicate how often each of the statements below is descriptive of you.

Statement	Never	Rarely	Sometimes	Often
*1. How often do you feel that you are "in tune" with the people around you?	1	2	3	4
2. How often do you feel that you lack companionship?	1	2	3	4
3. How often do you feel that there is no one you can turn to?	1	2	3	4
4 How often do you feel alone?	1	2	3	4
*5. How often do you feel part of a group of friends?	1	2	3	4
*6. How often do you feel that you have a lot in common with the people around you?	1	2	3	4
7. How often do you feel that you are no longer close to anyone?	1	2	3	4
8. How often do you feel that your interests and ideas are not shared by those around you?	1	2	3	4
*9. How often do you feel outgoing and friendly?	1	2	3	4
*10. How often do you feel close to people?	1	2	3	4
11. How often do you feel left out?	1	2	3	4
12. How often do you feel that your relationships with others are not meaningful?	1	2	3	4
13. How often do you feel that no one really knows you we11?	1	2	3	4
14. How often do you feel isolated from others?	1	2	3	4
*15. How often do you fee1 you can find companionship when you want it?	1	2	3	4
*16. How often do you feel that there are people who really understand you?	1	2	3	4
17, How often do you feel shy?	1	2	3	4
18. How often do you feel that people are around you but not with you?	1	2	3	4
*19. How often do you feel that there are people you can talk to?	1	2	3	4
*20. How often do you feel that there are people you can turn to?	1	2	3	4

Appendix 6: The Parental Stress Scale (Berry & Jones, 1995)

The following statements describe feelings and perceptions about the experience of being a parent. Think of each of the items in terms of how your relationship with your child or children typically is. Please indicate the degree to which you agree or disagree with the following items by selecting the appropriate response.

1. I am happy in my role as a parent.
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

2. There is little or nothing I wouldn't do for my child(ren) if it was necessary.
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

3. Caring for my child(ren) sometimes takes more time and energy than I have to give.
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

4. I sometimes worry whether I am doing enough for my child(ren).
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

5. I feel close to my child(ren).
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

6. I enjoy spending time with my chid(ren).
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided

- ○ Agree
- ○ Strongly agree

7. My child(ren) is an important source of affection for me.
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

8. Having child(ren) gives me a more certain and optimistic view for the future.
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

9. The major source of stress in my life is my child(ren).
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Undecided
   - ○ Agree
   - ○ Strongly agree

10. Having child(ren) leaves little time and flexibility in my life.
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

11. Having child(ren) has been a financial burden.
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

12. It is difficult to balance different responsibilities because of my child(ren).
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

13. The behaviour of my child(ren) is often embarrassing or stressful to me.
    - ○ Strongly disagree

- ○ Disagree
- ○ Undecided
- ○ Agree
- ○ Strongly agree

14. If I had to do it over again, I might decide not to have children.
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

15. I feel overwhelmed by the responsibility of being a parent.
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

16. Having child(ren) has meant having too few choices and too little control over my life.
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

17. I am satisfied as a parent
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

18. I find my child(ren) enjoyable.
    - ○ Strongly disagree
    - ○ Disagree
    - ○ Undecided
    - ○ Agree
    - ○ Strongly agree

Appendix 7: Generalised Anxiety Disorder Assessment (GAD-7; Spitzer, Kroenke, Williams & Lowe, 2006)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

1. Feeling nervous, anxious or on edge?
    ○ Not at all
    ○ Several days
    ○ More than half the days
    ○ Nearly every day

2. Not being able to stop or control worrying?
    ○ Not at all
    ○ Several days
    ○ More than half the days
    ○ Nearly every day

3. Worrying too much about different things?
    ○ Not at all
    ○ Several days
    ○ More than half the days
    ○ Nearly every day

4. Trouble relaxing?
    ○ Not at all
    ○ Several days
    ○ More than half the days
    ○ Nearly every day

5. Being so restless that it is hard to sit still?
    ○ Not at all
    ○ Several days
    ○ More than half the days
    ○ Nearly every day

6. Becoming easily annoyed or irritable?
    ○ Not at all
    ○ Several days
    ○ More than half the days
    ○ Nearly every day

7. Feeling afraid as if something awful might happen?
    ○ Not at all

- Several days
- More than half the days
- Nearly every day

Appendix 8: Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days
    - ○ Nearly every day

2. Feeling down, depressed, or hopeless?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days
    - ○ Nearly every day

3. Trouble falling or staying asleep, or sleeping too much?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days
    - ○ Nearly every day

4. Feeling tired or having little energy?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days
    - ○ Nearly every day

5. Poor appetite or overeating?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days
    - ○ Nearly every day

6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days
    - ○ Nearly every day

7. Trouble concentrating on things, such as reading the newspaper or watching television?
    - ○ Not at all
    - ○ Several days
    - ○ More than half the days

    - Nearly every day

8. Moving or speaking so slowly that other people could have noticed?
    - Not at all
    - Several days
    - More than half the days
    - Nearly every day

9. Thoughts that you would be better off dead, or of hurting yourself in some way?
    - Not at all
    - Several days
    - More than half the days
    - Nearly every day

Appendix 9: Four-Item measure of Social Identification (FISI; Postmes et al., 2013)

Below are some statements, please select the answers that are the most appropriate for you.

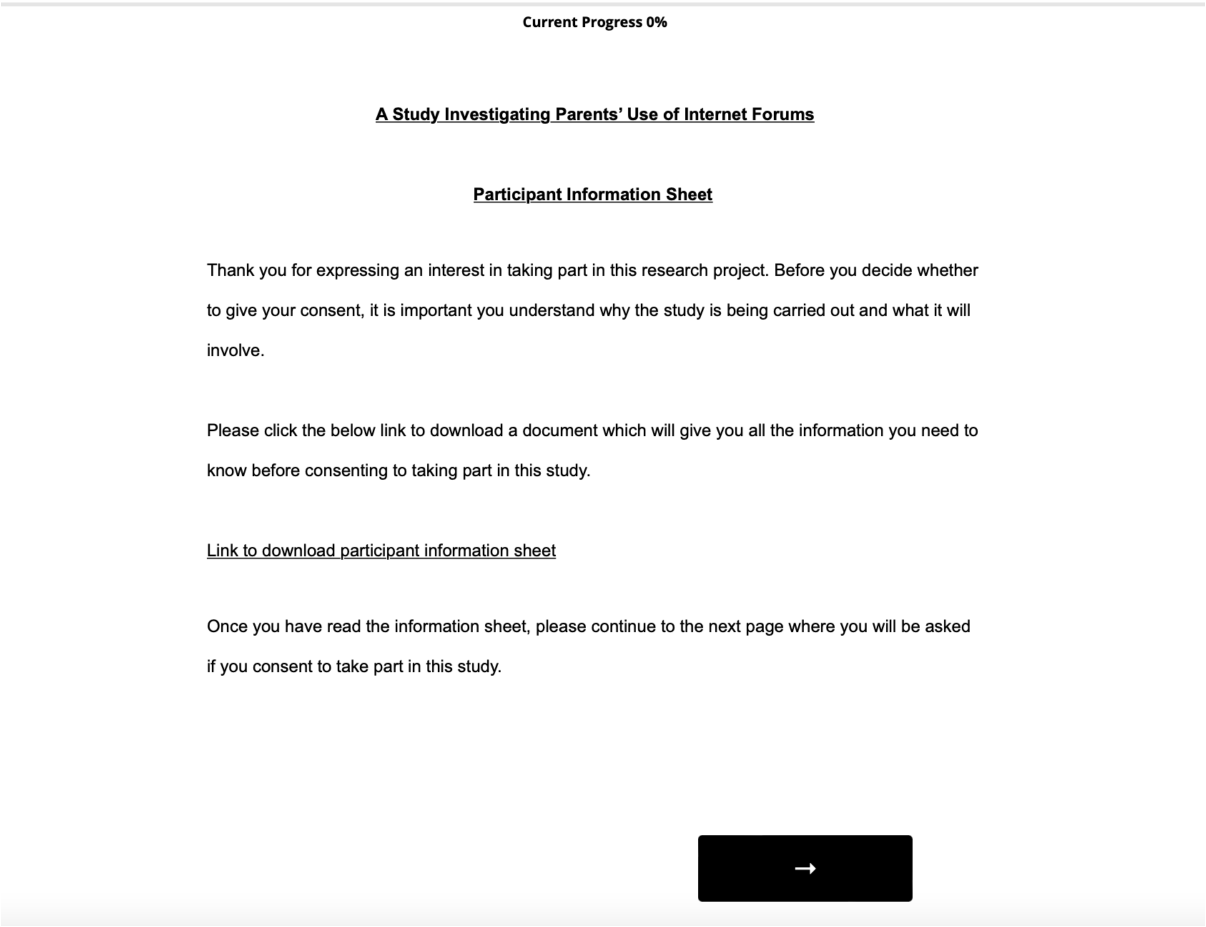
1. I identify with other parents on internet support groups/forums
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Somewhat disagree
   - ○ Neither agree nor disagree
   - ○ Somewhat agree
   - ○ Agree
   - ○ Strongly agree

2. I feel committed to the internet support group/forum
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Somewhat disagree
   - ○ Neither agree nor disagree
   - ○ Somewhat agree
   - ○ Agree
   - ○ Strongly agree

3. I am glad to be part of the internet support group/forum
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Somewhat disagree
   - ○ Neither agree nor disagree
   - ○ Somewhat agree
   - ○ Agree
   - ○ Strongly agree

4. Being part of the internet support group/forum is an important part of how I see myself
   - ○ Strongly disagree
   - ○ Disagree
   - ○ Somewhat disagree
   - ○ Neither agree nor disagree
   - ○ Somewhat agree
   - ○ Agree
   - ○ Strongly agree

Appendix 10: Study Questionnaire Introduction Page on Qualtrics



Current Progress 0%

A Study Investigating Parents' Use of Internet Forums

Participant Information Sheet

Thank you for expressing an interest in taking part in this research project. Before you decide whether to give your consent, it is important you understand why the study is being carried out and what it will involve.

Please click the below link to download a document which will give you all the information you need to know before consenting to taking part in this study.

Link to download participant information sheet

Once you have read the information sheet, please continue to the next page where you will be asked if you consent to take part in this study.

Appendix 11: Participant Information Sheet

10/06/2021 v2

Department of Psychology
Royal Holloway University of London
Egham, Surrey, TW20 0EX
www.royalholloway.ac.uk/psychology

Participant Information Sheet

A Study Investigating Parents' Use of Internet Forums

Thank you for expressing an interest in taking part in this research project. Before you decide whether to give your consent, it is important you understand why the research is being done and what it will involve.

Purpose and background to the research

Over recent years, there has been a rise in the number and usage of online support forums for parents. However, there is a lack of research that has investigated what factors are associated with parents' engagement with such groups. This study aims to look at what factors are associated with parents' use of online support forums.

This research is being undertaken as part of the research requirements for a doctorate in clinical psychology at Royal Holloway, University of London.

Do I have to take part?

No, it is up to you to decide whether or not to take part. If you do decide to take part, you will be able to keep a copy of this information sheet and you should indicate your agreement to the consent form. You can withdraw at any time, until we have completed the study. You do not have to give a reason.

What does the study involve?

If you decide to take part, you will be sent an email with a link to complete an online questionnaire.

What are the potential benefits of taking part?

Your participation will hopefully increase understanding as to how parents who identify as having children with mental health needs use the internet, specifically internet forums. It will allow investigation into whether there are any associations between engagement with these fora and positive outcomes, such as reduced loneliness and stress, which will inform future research into *how* these fora are effective and benefits of these for parents of children with mental health difficulties.

You may also choose to be entered into a prize draw by entering your email address.

What are the potential risks of taking part?

You will be asked to complete questionnaires about your mood and mental health, which you may potentially find distressing. Support resources will be provided at the end of the questionnaire and are also detailed below:

If you need help with your own mental health support, please discuss with your GP. If you require urgent support due to your mental health, please call 111. You may also speak to Samaritans by calling 116 123 or emailing jo@samaritans.org

This project has been given ethical approval by the Research Ethics Committee at Royal Holloway. The REC Project ID is: 2655.

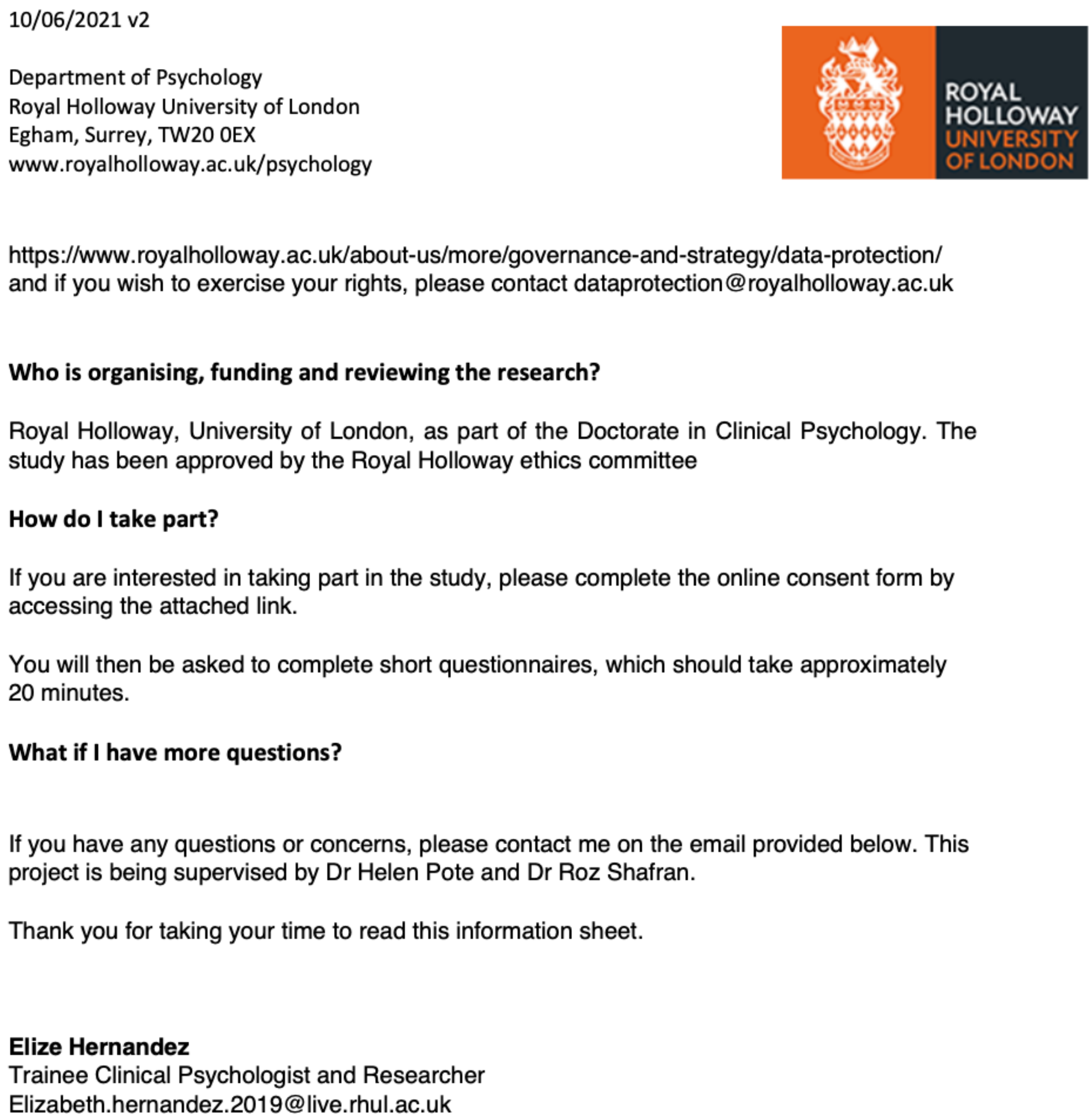
How will my information be kept confidential?

Your information will be stored securely and kept strictly confidential and anonymised. Your consent form will be stored separately from the responses you provide.

Royal Holloway, University of London, will act in accordance with the General Data Protection Regulation (GDPR) and the Data Protection Act 2018 when controlling and processing your personal data.

GDPR statement

Important General Data Protection Information (GDPR) Royal Holloway, University of London is the sponsor for this study and is based in the UK. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. Any data you provide during the completion of the study will be stored securely on hosted on servers within the European Economic Area'. Royal Holloway is designated as a public authority and in accordance with the Royal Holloway and Bedford New College Act 1985 and the Statutes which govern the College, we conduct research for the public benefit and in the public interest. Royal Holloway has put in place appropriate technical and organisational security measures to prevent your personal data from being accidentally lost, used or accessed in any unauthorised way or altered or disclosed. Royal Holloway has also put in place procedures to deal with any suspected personal data security breach and will notify you and any applicable regulator of a suspected breach where legally required to do so. To safeguard your rights, we will use the minimum personally-identifiable information possible (i.e., the email address you provide us). The lead researcher will keep your contact details confidential and will use this information only as required (i.e., to provide a summary of the study results if requested and/or for the prize draw). The lead researcher will keep information about you and data gathered from the study, the duration of which will depend on the study. Certain individuals from RHUL may look at your research records to check the accuracy of the research study. If the study is published in a relevant peer-reviewed journal, the anonymised data may be made available to third parties. The people who analyse the information will not be able to identify you. You can find out more about your rights under the GDPR and Data Protection Act 2018 by visiting



10/06/2021 v2

Department of Psychology
Royal Holloway University of London
Egham, Surrey, TW20 0EX
www.royalholloway.ac.uk/psychology

https://www.royalholloway.ac.uk/about-us/more/governance-and-strategy/data-protection/ and if you wish to exercise your rights, please contact dataprotection@royalholloway.ac.uk

Who is organising, funding and reviewing the research?

Royal Holloway, University of London, as part of the Doctorate in Clinical Psychology. The study has been approved by the Royal Holloway ethics committee

How do I take part?

If you are interested in taking part in the study, please complete the online consent form by accessing the attached link.

You will then be asked to complete short questionnaires, which should take approximately 20 minutes.

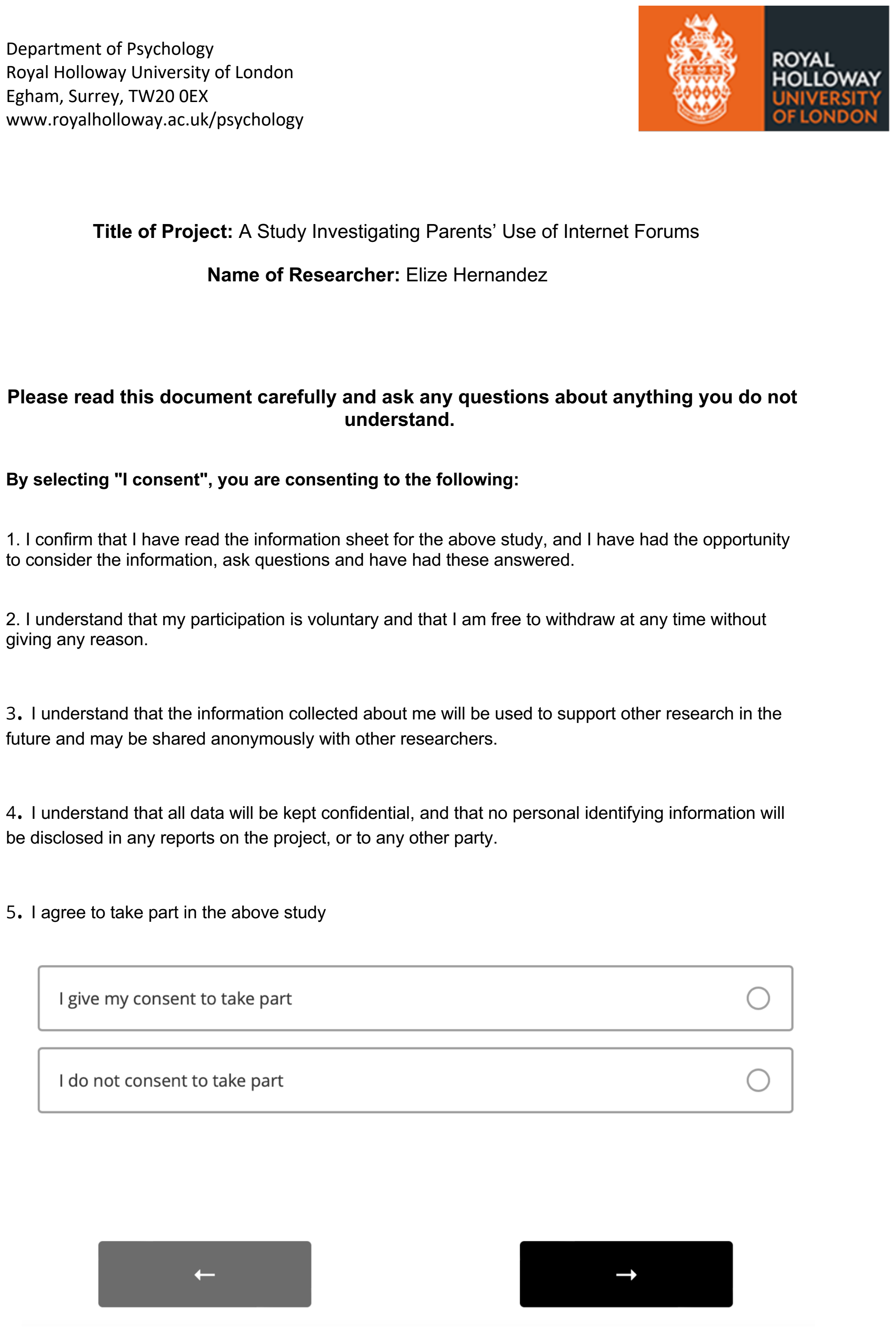
What if I have more questions?

If you have any questions or concerns, please contact me on the email provided below. This project is being supervised by Dr Helen Pote and Dr Roz Shafran.

Thank you for taking your time to read this information sheet.

Elize Hernandez
Trainee Clinical Psychologist and Researcher
Elizabeth.hernandez.2019@live.rhul.ac.uk

Appendix 12: Participant Consent Form



Department of Psychology
Royal Holloway University of London
Egham, Surrey, TW20 0EX
www.royalholloway.ac.uk/psychology

Title of Project: A Study Investigating Parents' Use of Internet Forums

Name of Researcher: Elize Hernandez

Please read this document carefully and ask any questions about anything you do not understand.

By selecting "I consent", you are consenting to the following:

1. I confirm that I have read the information sheet for the above study, and I have had the opportunity to consider the information, ask questions and have had these answered.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.

3. I understand that the information collected about me will be used to support other research in the future and may be shared anonymously with other researchers.

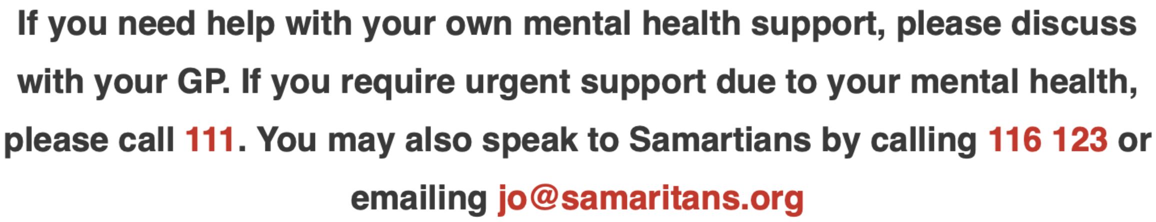
4. I understand that all data will be kept confidential, and that no personal identifying information will be disclosed in any reports on the project, or to any other party.

5. I agree to take part in the above study

I give my consent to take part ○

I do not consent to take part ○

Appendix 13: Crisis Information Displayed to Participants



If you need help with your own mental health support, please discuss with your GP. If you require urgent support due to your mental health, please call 111. You may also speak to Samartians by calling 116 123 or emailing jo@samaritans.org