

Flinders University
Flinders Human Behaviour
& Health Research Unit

Title: *Teachable moments: how can the community capitalise on existing and future support services to improve the mental health and wellbeing of 'new' fathers?*

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EXECUTIVE SUMMARY

BACKGROUND

The South Australian Mental Health Commission (SAMHC) released the South Australian Mental Health Strategic Plan in December 2017, with the aim of building, sustaining and strengthening the mental health and wellbeing of South Australians. Given the prevalence of fathers who experience anxiety and depression during their partner's pregnancy and following the birth of their baby, and the tendency of this population to be less likely to seek out help for these issues, SMS4DadsSA – a perinatal mental health support pilot project for expectant fathers – was approved as one of the inaugural projects to commence implementation of the strategic plan. In order to gain a broader understanding of the evidence base in the area of 'new' fathers, and to position the future outcomes of the pilot project, SAMHC decided to collaborate with Flinders University to undertake a research analysis of the efficacy of interventions that seek to improve the mental health of 'new' fathers. Given the wide range of methodologies and designs of research in this area, a narrative synthesis, as compared to a meta-synthesis or meta-analysis, was chosen to capture these objectives.

METHOD

A systematic search of the literature took place in September 2018 to identify studies and papers exploring various mental health supports available to fathers of new children. The definition adopted of a new child was - a new biological, step, or adopted child that had entered a father's life. Programs and interventions which set out to increase a father's awareness and skills to deal with the challenges faced when welcoming a new child were sought, as opposed to research that exclusively placed an emphasis on treatment of psychological distress experienced. A broad range of support was examined to incorporate not just face-to-face contact, such as antenatal classes, but also support accessed via the Internet, telephone, texting services, mobile phone applications (or 'apps'), videoconferencing and other types of eHealth.

Numerous databases were searched (e.g., Ovid Medline, CINAHL, PsychInfo, and Scopus etc.) within the identified range - 1946 – 2018. A combination of text terms and medical subject headings (MeSH) were used to maximise the volume of literature retrieved such as *father, newchild, perinatal, support, apps, eHealth* etc. Duplicates were removed, and titles and abstracts screened by two authors (AV, MH). The references of included studies were screened for any further relevant articles. A manual search of grey literature via Google

Advanced Scholar was conducted too. All searches were run on September the 7th 2018 within multiple databases, with results subsequently exported to an Endnote library. Following this, all papers were screened against pre-specified inclusion and exclusion criteria. The main reasons for excluding papers included (a) fathers were not 'new'; (b) child was too old (i.e., > 6 years of age); (c) focus was not on fathers (e.g., did not distinguish between mothers and fathers in the study); (d) study sample was high risk (e.g., child in neonatal intensive care [NICU]); (e) study design / article was not appropriate (i.e. was an opinion or promotional piece); and (f) paper was not relevant and / or the full-text could not be obtained in English. Data extracted from papers where the full-text was screened included: study population, study method, intervention, assessment of intervention / outcomes, results, conclusions, limitations and recommendations. The data were then synthesised narratively and presented in tabular format.

RESULTS

Twenty eight papers reported on interventions designed to support and/or educate new fathers. Findings were split by programs that used video to engage fathers, those that were held in-person, those that were held online, and those that used 'apps' / Short Message Service (SMS). Approximately 4 papers incorporated an intervention which clearly aimed to *support* fathers of new children; approximately 10 papers incorporated an intervention which clearly aimed to *educate* fathers of new children; and 14 papers appeared to incorporate an intervention which aimed to *both* support and educate fathers of new children. Tentative support was found for interventions, fathers were generally satisfied with them, and any suggestions for improvement related to increased interactivity and navigability. A further 6 review papers were identified.

Thirty five papers used the voices of fathers' or reported their preferences to describe the experience of fatherhood, their experiences of support, and/or their recommendations for support. A fathers experience of fatherhood was indicated to be positive (best job in the world), but uncertain (fears and concerns, disconnect, self-conscious) and challenging at the same time (work-life balance, multiple roles, exhaustion). Fathers reported that in terms of their experience of support, there were common barriers to support (not knowing, excluded, feeling belittled, stigma, privacy, and inaccessible), sources of support (co-parent, friends, family, community, self, and other), and support needs (tailored, timing/duration, credible, practical, accessible, specific, and flexible). Fathers recommended that effective support needs to pay attention to mode (in-person, individual vs. group, web-based vs. mobile 'apps'), delivery (location, facilitator, timing, and duration), content (useful / relevance, credible), feature / functions (interactive and ease of access), and tone (light-hearted).

Across all of the included research the authors provided specific recommendations for the focus of programs that target the health and wellbeing of new fathers, as well as the methodological approaches that should be undertaken. Specifically, study authors offered recommendations for the attitudes, behaviours, and actions of healthcare professionals, for the healthcare and policy implications, for support services and its content, and for future research and methodological improvements.

DISCUSSION

Tentative support is provided for interventions targeting the mental health of new fathers. However, actual efficacy / effectiveness of interventions was unclear as many of the studies lacked the appropriate methodological approach to determine this. Fathers reported the experience of fatherhood as “*joyous*”, but also an uncertain “*roller-coaster-ride*”. Fathers felt initially ‘*disconnected*’ to their child, challenged by the multiple roles they now held, and their shifting position of importance in the family. Fathers reported the common barriers to accessing support as not knowing what type of, and where, support was available, feeling “*left-out*” of or “*belittled*” by support, and that the stigma, lack of privacy, and inaccessibility associated with support discouraged their help-seeking. Common sources of support reported by fathers included their co-parent, friends and family, midwives, the community, and online support / social media blogs. This support then needed to be credible / practical / specific / accessible and tailored to a father’s role. While variation was reported in terms of preference for support, the most important elements were that the support needed to be tailored, credible, interactive, engaging, useful (relevant), on-going, light-hearted, and accessible when needed (i.e., targeted to a child’s developmental stage).

STUDY AUTHORS’ RECOMMENDATIONS

Pregnancy should be viewed as a teachable moment with fathers made to feel comfortable and involved in parenting programs. Fathers may be more open to, aware of, interested in, and receptive to supports designed to promote theirs and their family’s wellbeing, and these supports need to be promoted to engage the willing but potentially reluctant fathers. Hybrid and accessible approaches should be adopted to do this, and be monitored by midwives, involve co-parents, incorporate the use of mentors, be orientated to the whole family, offer opportunities for anonymity, be tailored to fathers’ preferences, contain interactive content, portray fathers as ‘fathers’ rather than unwise / uninterested stereotypes, and encourage social connection with others. Furthermore, content should be evidence-based, adopt a conversational tone, and focus on specific symptoms (e.g., postpartum depression, breastfeeding) and how to facilitate self-care and formal treatment for their co-parent. Future

investigations must clarify the efficacy of different types of support for fathers, including the potential of empowerment-disempowerment by telemedicine / mobile 'apps', using high quality research methods such as randomized control trials and longitudinal design.

CONCLUSION

In line with the objectives of the South Australian Mental Health Commission (SAMHC), the current report set out to build an evidence-base to inform resources and services aimed at supporting the mental health and wellbeing needs of 'new' fathers. A systematic search of the literature identified 68 studies. A narrative synthesis was undertaken to 'tell the story' of the combined findings. While there are numerous essential take-home messages highlighted in the report, arguably the indication that 'new' fathers report feeling "*excluded*", "*inept*", and "*secondary*" are important to note in terms of their mental health and wellbeing. Becoming a "*good father*" does not always come naturally and may take time to achieve for some, but what it is apparent is that the perinatal period is a "*teachable moment*" that is not fully harnessed to support the mental health and wellbeing needs of new fathers, which then directly impacts on the mental health and wellbeing needs of their partners and children. It is hoped that the current report provides a platform for the community to fully utilise this "*teachable moment*" and assist to engage fathers, prepare them realistically for the challenges they may face, and facilitate their confidence to be a "*supportive and involved*" figure in the family unit.

BACKGROUND

The South Australian Mental Health Commission (SAMHC) was established by the South Australian Government with a key task of leading the development of the South Australian Mental Health Strategic Plan. The aim of the strategic plan, released in December 2017, is to provide an integrated whole-of-person, whole-of-life, whole-of-community and whole-of-government approach to building, sustaining and strengthening the mental health and wellbeing of South Australians. The SAMHC consulted with a cross section of the South Australian community to inform the development of the Plan (over 2,200 people), and as part of those consultations it was found that:

- Parenthood means a great deal to South Australian men – they are excited to be fathers and they are keen to do a good job.
- However, parents indicated that ‘raising children’ had changed a lot from when they were growing up, there is less information about being a father as there is for a mother, and men communicate differently to women.

It is known that approximately one in 20 men experience anxiety and depression during their partner’s pregnancy, and approximately one in 10 men following the birth of their baby (Paulson & Brazemore, 2010). Anxiety and depression in fathers during a child’s first year can also have a detrimental impact on the child and the father’s partner. Furthermore, compared to women, research shows men are less likely to acknowledge or seek help for mental health issues (Galdas, Cheater, & Marshall, 2005).

Among the core objectives of the strategic plan, three goals were established:

- To coordinate and provide strategies and opportunities to build the wellbeing of infants, children and young people with a focus on those who experience disadvantage or vulnerability, as well as provide support to parents, families and caregivers across South Australia to promote and build good mental health and wellbeing;
- To coordinate a high impact evidence-based, universal mental health and wellbeing promotion and education campaign, that builds on work currently being undertaken and leverages current best practice to build skills in strengthening mental health and wellbeing for all South Australians; and
- To develop and deliver a range of strategies to promote wellbeing to, and prevent mental health issues in, target groups based on key life transition points.

A perinatal mental health support pilot project for expectant fathers, called SMS4 DadsSA, was approved as one of the inaugural projects to commence implementation of the strategic plan. SMS4DadsSA is an online information and support program run by the Fathers and Families Research Program (Faculty of Health and Medicine, University of Newcastle) to assist men in their transition to fatherhood. To gain a broader understanding of the evidence base in the area of 'new' fathers mental health, and to position the future outcomes of the pilot project into a larger context (i.e., how a fathers good mental health and wellbeing can in turn support the mental health and wellbeing of their partners and children) , SAMHC decided to seek further evidence on the effectiveness of interventions that seek to improve the mental health of new fathers. With this in mind, the commission developed a partnership with Flinders University in order to undertake this research analysis – to build an evidence-base of the mental health needs of 'new' fathers – to inform future approaches that seek to improve mental health and wellbeing in this population.

DEFINITIONS

The following definitions are listed for their relevance to the focus of this review. The authors have chosen to define *New Fathers*, *Mental Health / Wellbeing*, *Mental Illness* and *Authors*, as these terms will likely emerge throughout any examination of the literature surrounding the perinatal period. It is possible that the transition to fatherhood, which may be a time of stress and anxiety, may lead to poor mental health and wellbeing, and subsequently mental illness in some cases. On the other hand, the transition to fatherhood may bring about a sense of wellbeing and improve one's mental health. Thus it is imperative to have a basic understanding of these terms.

NEW FATHERS

For the purposes of the current report, a *new father* is any man who has had a child – for which he is responsible for – enter his life. In the context of the current report, the child in question may be a biological child, a stepchild from a new relationship, an adopted or foster child, or any other circumstance in which the male becomes legally responsible for a child up to 6 years of age. This broad and overarching definition was adopted to ensure all relevant research was captured, given that the emotional / social / relationship challenges of fatherhood are similar regardless of the legal or biological relationship to a child.

MENTAL HEALTH / WELLBEING

For the purposes of the current report the terms *mental health and wellbeing* will refer to a state, as defined by the World Health Organisation (2005), in which an individual realises his

or her own potential, can cope with the normal stresses of life, and is able to make a contribution to his or her community. An individual with good mental health / wellbeing is considered to be able to handle day-to-day events and obstacles, function effectively among his or her peers and society, and engage in health-promoting behaviour (Australian Bureau of Statistics [ABS], 1997).

MENTAL ILLNESS

An individual with *mental illness* is considered to exhibit a clinically significant behavioural or psychological set of symptoms, or be at significantly higher risk of these, which are associated with present distress, pain, disability, or a loss of freedom that impacts on their ability to function effectively (American Psychiatric Association [APA], 2000).

AUTHORS

Throughout the document, the term 'review' authors will refer to the authors of the current report who conducted the systematic review and narrative synthesis, while the term 'study' authors will refer to the authors of the papers identified by the systematic review and included in the narrative synthesis.

METHOD

The approach adopted was a systematic review and narrative synthesis in order to review all the relevant literature regarding mental health support for fathers of new children. A narrative synthesis adopts a textual approach to the investigation of similarities and differences between study outcomes in relation to a particular question in order to then enlighten practice or policy (Lisy & Porritt, 2016; Popay et al., 2006). Practically, a narrative approach is the synthesis of findings from numerous studies with multiple methodologies to 'tell the story' given by combined results, not only the relative efficacy of interventions (Popay et al., 2006).

TYPES OF STUDIES

To avoid missing potential key articles of interest, review authors did not limit the type of study at the preliminary search stage. The authors were inclusive of both quantitative and qualitative research, as well as commentaries and descriptive pieces, to retrieve a broad array of reviews, intervention outcomes, experiences of fathers' and examinations of support resources for fathers. The types of studies were inclusive of randomized controlled trials, systematic reviews, cohort studies (cross-sectional or longitudinal), quasi-experimental

studies, case-control studies, qualitative semi-structured interviews and open-ended response / feedback studies.

TYPES OF PARTICIPANTS

- Fathers / dads (e.g., first-time, second-time, biological, adoptive, foster, single etc.)
- New child (i.e., a child from within the womb to 6 years of age).

FOCUS OF PAPERS

- Interventions
- eHealth resources (e.g., mobile phone applications 'apps', email services, texting services, videoconferencing, Internet / web-sites, online chatrooms / forums, social media etc.)
- Telephone support
- Antenatal education / classes
- Dads' playgroups / evenings
- Experiences of fathers (i.e., in relation to formal and informal support, informational resources utilised, barriers to seeking help etc.)
- Assessments of fathers' use of support and informational resources and their preferences
- Systematic Reviews (e.g., narrative syntheses, realist syntheses, meta-analyses)

OUTCOME

- Improving paternal outcomes such as mental health, wellbeing and coping and preventing or reducing psychological or physical distress

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

The review authors systematically searched within multiple databases to identify the relevant studies. A scoping search was conducted in larger databases to identify the relevant terms and to identify the potential key articles. PsychInfo was used to draft the main search, which incorporated both subject headings (MESH terms) and text-words (refer to Appendix A for full search terms). The search was tested against key articles to make sure the search could locate them. After finalising the search, it was converted and applied to the following databases.

- Ovid Medline (1946 to present)
 - Epub Ahead of Print
 - In-Process & Other Non-Indexed Citations
 - Ovid MEDLINE Daily
- CINAHL (EBSCOhost)
- PsychInfo (Ovid)
- Ovid Emcare (1995 to present)
- ProQuest
- Scopus

The search was limited to English language. No additional publication dates limit was applied aside from the upper limit of 7th September. Studies identified through the search strategy, and that appeared to meet the inclusion criteria, were retrieved in full and their reference lists examined to identify any additional studies that met the inclusion criteria. A manual search of Google Advanced was also conducted to identify any 'grey' literature otherwise not captured in peer reviewed databases, and any additional studies that met the inclusion criteria were examined.

DATA COLLECTION AND ANALYSIS

There were four stages to the review process.

Stage 1:

Two review authors (AV, MH) screened the titles and abstracts of studies identified from the search strategy. Any disagreement regarding relevance of the abstracts was resolved through discussion. Full electronic copies of studies were obtained and examined where there was insufficient information in the abstracts to make a decision on inclusion / exclusion.

Stage 2:

Two review authors (AV, MH) independently examined full paper copies of articles against the inclusion criteria (summarised briefly again below).

- Types of participants: *Fathers* of new children in any country (e.g., first time, experienced, biological, adopted, fostered, or a single parent).
- Types of interventions / support: Any kind of informational support-focused interventions delivered individually or in groups or in a hospital, a community, at

home, via face-to-face, or via technology that focused on fathers during the perinatal period (i.e., during pregnancy to the postpartum period)

- Types of studies: randomized controlled trials, quasi-experimental, qualitative interviews, commentaries and perspective pieces.
- Types of outcome measures: Paternal outcomes related to coping, wellbeing, self-efficacy, father-infant attachment, and relationship satisfaction etc.

Any disagreements regarding inclusion were resolved by discussion.

Stage 3:

Data were extracted from the relevant papers using a data collection tool. Data extracted included: study aim, study location, study population, study methods, intervention used, outcome variables, results, limitations and recommendations.

Stage 4:

The primary analysis was an exploration of the various mental health supports available to fathers of new children and to identify strengths, limitations and preferences. All relevant papers were narratively described and presented in tables.

SEARCH RESULTS

DESCRIPTION OF STUDIES

Electronic database searching yielded 4,232 citations. Google Advanced Scholar was used to identify grey literature and after excluding duplicates, only 1 unique additional record was identified (see flow chart of study selection in *Figure 1* below). After removing duplicates, 2,867 studies were screened by title and abstract, excluding 2,720. From the search, 147 studies met eligibility criteria and were retrieved in full for further assessment. Two review authors (AV, MH) reviewed these papers independently, any discrepancies were then resolved through discussion, and 68 papers were identified as meeting the inclusion criteria. Seventy-nine papers were excluded as they did not meet the inclusion criteria. The reasons for exclusion are noted in *Figure 1* below.

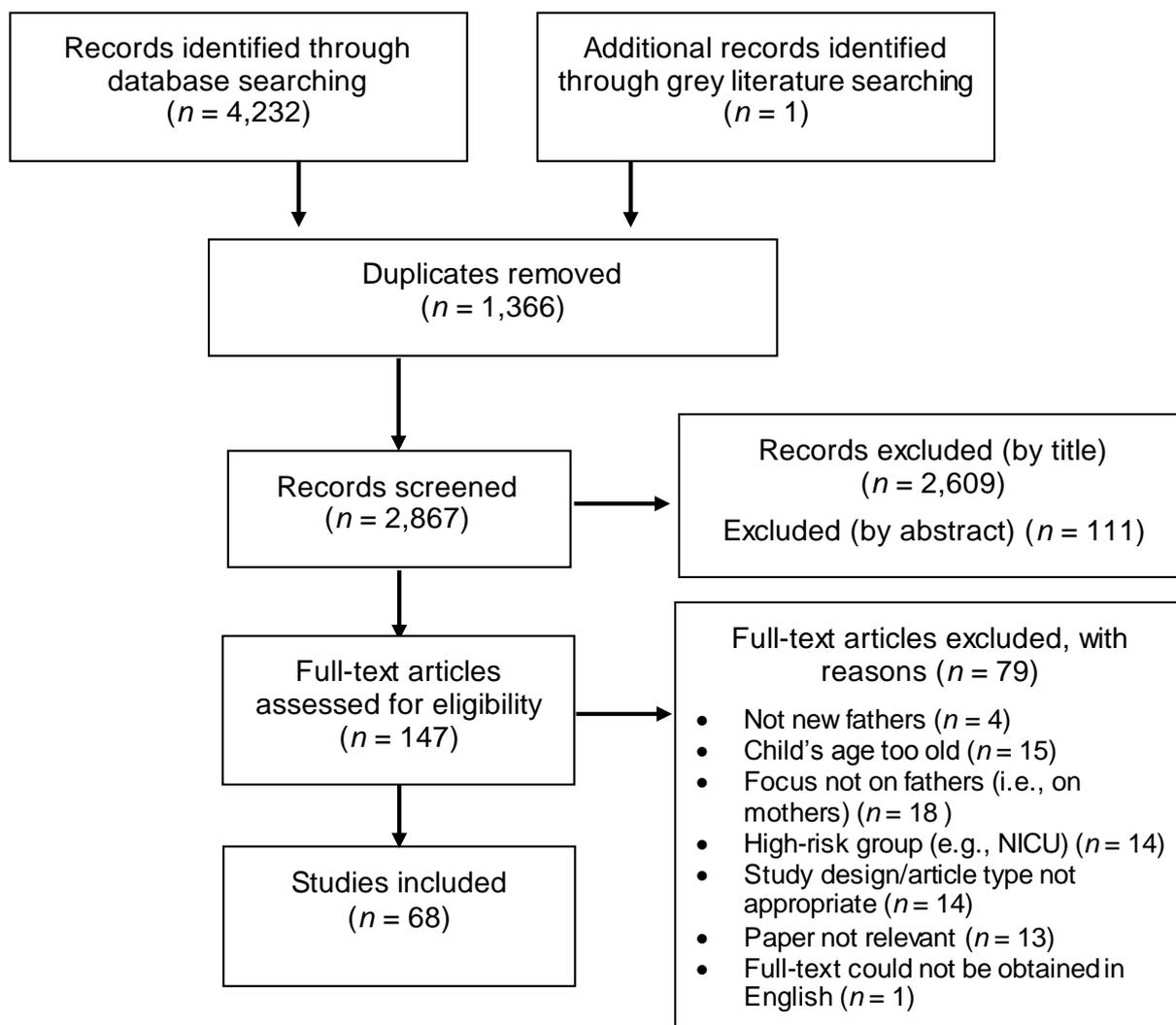


Figure 1. PRISMA Flow-chart

INCLUDED STUDIES

The final number of studies included in the review represented a vast array of study designs and experimental methodologies. Considering the number of studies that were retrieved from the 1980s / 1990s and 2000s that were relevant to the topic, the review authors firstly organised the included studies into decade / period of publication time (see Table 1), to reveal the point in time in which various modes of delivery were introduced and incorporated in study designs. Only one of the studies was identified as a randomized controlled trial (RCT) (Shorey, Lau, et al., 2017). While two other reports appeared to adopt a similar methodology, there was a lack of methodological detail in order to classify as RCT's with confidence. Two further studies used qualitative approaches to analyse the data from the

intervention group of an RCT (Benzies & Magill-Evans, 2015; Shorey, Yang, & Dennis, 2018). The majority of studies that evaluated or assessed an intervention adopted a pre-test post-test design, often with qualitative interviews or feedback forms as a follow-up measure post-intervention. In addition, many of the studies did not test the efficacy of the intervention, rather simply assessed its feasibility, usability and acceptability. Refer to Table 2 and Table 3 for a summary of results and recommendations, respectively, for each of the studies focusing on a specific intervention / program for fathers of new children. The vast majority of papers included in the overall review were qualitative analyses of fathers' or practitioners' experiences of the transition to parenthood, barriers to help-seeking, support needs and support preferences. A small number of studies ($n = 7$) examined paternal outcomes related to psychological distress, postnatal depression and health-risk behaviours among expectant or new fathers.

PARTICIPANTS

Of the 68 papers included in the narrative synthesis review, 37 had a clear father-specific focus, whilst 31 incorporated mothers into the analysis (See Appendix B for these groupings). The studies incorporating mothers were only included if the paper findings clearly stipulated between parental response. This decision was made by the review authors in response to an initial search of the literature, which revealed that involving the co-parent in recruitment for support interventions or general research projects may be an incentive for involvement of fathers. In addition, some of the interventions incorporated a co-parenting angle targeting the co-parenting relationship at the transition to parenthood.

Across the 68 papers included in the narrative synthesis review, approximately 12,660 fathers were participants. Note that this is only a general estimate due to six papers being reviews, one paper being from the perspective of practitioners, one a government report, and two an analysis of posts made to online forums / blogs, of which no demographic details were given in relation to sample size. In addition the number is largely inflated due to the inclusion of two studies which both utilised samples from larger longitudinal surveys (Deater-Deckard, Pickering, Dunn, & Golding, 1998, $N = 7018$ fathers; and Johansson, Rubertsson, Radestad, & Hildingsson, 2010, $N = 1105$ fathers).

INTERVENTIONS

Due to the limited number of studies examining support interventions with a sample of fathers only / assessing paternal outcomes, the review authors have included those which may assess broader family outcomes and incorporated measures for mothers – that being

said, this was restricted to only those which placed the focus on fathers. Studies which were not able to distinguish between fathers and mothers in the results section were excluded from the review.

EXCLUDED STUDIES

The authors excluded 79 studies at the stage of full appraisal. The reasons for exclusion were:

- Fathers were not 'new'
- The child was too old (i.e., > 6 years of age),
- The focus was not on fathers (i.e., did not distinguish between mothers and fathers)
- The study sample was high risk (i.e., child in NICU)
- The study design / article was not appropriate (i.e., was an opinion or promotional piece),
- The paper was not relevant
- The full-text could not be obtained in English.
- The paper had already been sourced in the search

An additional 46,400 records were obtained from a grey literature search using Google Advanced. The first 40 of these records were screened by AV and MH for relevance to study objectives. Of these records, only 1 unique record was included (Fletcher & May, 2016) and 39 were excluded for the same types of reasons listed above.

Table 1.

The Number and Focus of Included Studies Relevant to Publication Period and Various Waves of Advancing Technology

1980's		1990's		2000's		2010-2015		2016-2018	
1981	1985	1996	1998	2004	2007				
1 st IBM computer	Microsoft Windows	Google Launched	Nokia 5110	Facebook Launched	iPhone Launched				
							Included to give a perspective of what was happening re technology at the times of the research		
5	3	10		22			28		
1- How information is delivered	1- Effectiveness of parent training	1- The narratives of new fathers	4- Analysis of chatroom content	1- Program to lower maltreatment			1- Accessing 'practitioners' reports		
4- The impact of social support	1- Influence of antenatal classes	8- Delivery of information via videoconference, evenings, surveys, web programs.	1- Analysis of forum content	1- Assessing 'apps'			5- Development of 'apps'		
	1- Rates of depression	1- Information use	5- Analysis of dads narratives	2- Assessing 'apps'			6- Narratives from dads		
			1- Analysis of dads needs	6- Assessing needs of dads			1- Exploring attachment in dads		
			2- Social media use	1- Exploring attachment in dads			2- Assessing eHealth programs		
			1- Internet use	2- Assessing service based programs			3- Assessing social connection programs		
			3- Rating of interventions	1- Effectiveness of perinatal classes			1- Exploring health seeking preferences		
			3- Use of applications – 'apps'*	1- Community factors involved in support			2- Program to enhance use of internet		
			1- Delivery of info via text						
			1- Systematic review						

Note. One of these studies (*) was a randomized-controlled trial (two group pre-test post-test design) assessing the 'Home-but not Alone' mobile-health application educational program (Shorey, Lau et al., 2017).

RESULTS

Due to the differing types of methodologies used in the included studies, the following section will appear in two parts. First, section 1 summarises the 28 studies that investigated interventions targeting new fathers, and the 6 systematic reviews identified. Next, section 2 contains the comments of fathers drawn from multiple studies that discuss the experience of being a new father and their recommendations for support. Within section 2 the recommendations of the authors of the included studies are also summarised in relation to (a) the attitudes, behaviours, and actions of healthcare professionals; (b) healthcare and policy implications; (c) support services; (d) support service content; (e) future research; and (f) methodological improvements. It is important to note that some of the content drawn from the 68 papers included may overlap in these sections. For example, a study that assesses a specific intervention, but also gathers a father's feedback on what they did or did not like about the intervention, may appear in both sections 1 and 2.

Section 1

From the 68 papers identified, the following section summarises the 28 papers which investigated interventions that provided information to, or improved the support offered to, fathers as they transitioned to fatherhood. These papers spanned over a 33 year period (1985 to 2018), employed various modes of delivery – from classes in-person to mobile phone 'apps' – and varied considerably in their focus. This section also summarises the 6 review papers identified.

CHARACTERISTICS OF STUDIES

Table 2 outlines the design and main findings of 28 studies which examined an intervention ($N= 23$) aimed to support / educate fathers of new children. The disparity in number here is due to a few of the interventions being assessed by different researchers over time and the refinement of prototypes. A summary of study design is difficult given the considerable variance in mixed methodology across the studies. Thus, please refer to Appendix B for a more detailed summary of the characteristics and findings of each study. In brief, only 1 of the 28 papers incorporating an intervention was a randomized controlled trial (RCT) testing the effectiveness of *Home-but not Alone* – a psychoeducation program delivered via mobile phone application to support new parents (Shorey, Lau, et al., 2017).

Table 2.
Summary of Intervention Studies, Design and Main Findings

Study	Intervention	Intervention Design	Main Findings
Crumette et al. (1985)	F-IIP Program ^a	Father-Infant 5-hour Interaction Program to aid preparation for parenthood.	Fathers were unanimously positive in their evaluation of F-IIP's content and purpose. Increased fathers' talking to / smiling at / eye-contact with infant.
Lindberg et al. (2009)	Videoconferencing ^b	Communication with midwives 24/7 during the first week after the birth.	Fathers felt that meeting the midwife via Video Conferencing was less invasive of privacy than a home-visit, but some found it superficial.
Lawrence et al. (2012)	VIIIP ^a	Video-feedback intervention to promote Positive Parenting and improve father-infant interaction.	Improved fathers' communication with and understanding of their child's thoughts and feelings. Flexibility of service rated as fundamental by fathers.
Benzies & Magill-Evans (2015)	FIIIP Program ^b	Video-modelled play designed to increase fathers' sensitivity and responsiveness to infant cues (Father-Infant Interaction Program).	Fathers liked the home visits and tailored feedback about play. The timing of the intervention important, 4 months was a good time. Helped validate their role as a father. IG fathers were more responsive to their baby than CG fathers.
Pfannenstiel & Honig (1991)	Information about Infants (III) ^a	Prenatal intervention for first-time fathers	Improved interaction with child for IG fathers, who were able to hold, feed and respond to their newborn infants in a more tuned-in and tender manner.
Gross et al. (1995)	Parent Training ^a	Program assisting parents to interact with toddlers.	Whilst mothers demonstrated significant improvements, IG fathers did not. Poor engagement, attendance and completion of homework assignments by fathers. Overall, parents felt positively about the program.
Diemer (1997)	Perinatal / Antenatal classes ^c	Father-focused childbirth education class with group discussion to increase expectant fathers' involvement with their child.	Mixed results. Fathers in IG (father-focused class) increased their reasoning during conflicts / housework activity. In both the IG and CG (traditional class), fathers' social network support increased but not overall coping responses.
Price (2001)	Dad's Evening ^c	Fathers postnatal evening to explore roles and expectations.	Most useful aspects of evening were baby resuscitation / meeting other fathers. Men's health was rated the least. 8pm was deemed a convenient meeting time.
Bourget et al. (2017)	Educational sessions ^a	Promoting a sense of mastery of anticipated paternal role.	Fathers very satisfied with intervention, especially content / format / preparation for their paternal role. Benefits found for first-time and experienced fathers.
Tellegen & Johnston (2017)	All-Day Group Triple P ^a	All day parenting program followed by phone calls to improve outcomes for children and parents.	High level of program satisfaction, with improvements in child problems, parenting styles, parental adjustment, and parental disagreement reported.
Grant et al. (2001)	FatherWork ^a	Online intervention to motivate and educate fathers.	Popular education resource, mostly visited in the late afternoon on weekdays
Cheng et al. (2003)	Breastfeeding Ed Program ^a	Program to provide new parents with necessary information on proper breastfeeding techniques.	The computer was viewed as a valuable learning tool. Graphics were preferred over the text-only programs. Text-only programs given higher score if viewed first. Viewing time of program (30-40 mins) was noted as an appropriate length.
Hudson et al. (2003)	New Fathers Network ^c	Online info, discussion, and access to nurses to improve first-time fathers' self-efficacy and parenting satisfaction.	Fathers indicated the site was easy to navigate, easy to find topics of interest, and well organised. Discussion with others seen to be the most valuable part. Parenting self-efficacy and satisfaction scores improved for IG.
	= Interventions using video	= Interventions in-person	= Online interventions
			= Interventions using 'apps' / SMS

Note. IG = Intervention Group; CG = Comparison / Control Group.

^a Education Intervention. ^b Support Intervention. ^c Intervention with both an educative and supportive aspect.

Table 2 (cont).
Summary of Intervention Studies, Design and Main Findings

Study	Intervention	Intervention Design	Main Findings
Self-Brown et al. (2015)	<i>Dad2K</i> ^c	Skills program targeting positive parenting skills and the prevention of child neglect and physical abuse. (Adaptation of <i>SafeCare</i>).	Fathers were on average, satisfied to very satisfied, with the program, particularly the technology-assisted components. Study provided support for the use of a “hybrid” approach (i.e., technology / provider) to engaging fathers.
Abbass-Dick et al. (2017)	e-health resource ^a	Breastfeeding resource targeting co-parenting.	Improved breastfeeding self-efficacy and knowledge but not co-parent relationship. Rated highly. Parents liked videos and delivery of information.
Pilkington et al (2017)	<i>Partners to Parents</i> ^b	Online intervention for preventing psychological distress, focused on enhancing partner support.	Fathers rated the content useful and liked the personalisation, but not the navigability and layout. Fathers suggested more interactive elements.
Danbjørg et al. (2015)	Telemedicine ‘app’ ^b	Telemedicine provided via a mobile phone ‘app’	Parents liked the ‘app’ and viewed it as a “lifeline”, to support and meet their needs. Showed potential to enhance self-efficacy / postnatal sense of security.
Hurwitz et al. (2015)	<i>Parent University</i> ^c	SMS-based automated intervention prompting parents to engage in more learning activities with their children.	Parents were satisfied with the service. Text messages were rated by most parents as an appropriate mode to receive support. Fathers who received the service engaged in more learning activities, particularly fathers of boys.
Lee & Walsh (2015)	<i>mDad</i> ^c	Father-friendly smartphone ‘app’ to help fathers learn about and engage with infants / toddlers.	Users liked the ‘app’, the ability to track developmental milestones, as well as brief, succinct and specific messages. Accessibility of ‘app’ was rated highly.
Fletcher et al. (2016)	<i>SMS4Dads</i> ^c	SMS-based informative and interactive support system for new fathers.	Fathers reported the messages as acceptable and relevant to their fathering.
Fletcher & May (2016)			Seen as a “virtual companion” during an identity transition. Average use = 21 weeks.
Fletcher, May et al. (2017)			Tentative support found for the use of mobile phone technology.
Fletcher, Hammond et al. (2017)	<i>Stayin’ On Track</i> ^c	SMS-based informative and interactive telephone support system for new Aboriginal fathers.	Preliminary support for its feasibility. Fathers viewed the resource as a source of pride, and as offering a viable, acceptable and sustainable support mechanism that caused them to view themselves as mentors and role models.
Mackert et al. (2017)	e-health application ^a	E-health application to educate men about pregnancy-related health.	Fathers found the application useful and informative, but suggested it needed more videos, interactive modules and access to further information.
Shorey, Lau et al. (2017)	<i>Home-but not alone</i> ^c	Psychoeducation programme delivered via a m-health ‘app’ (mobile health application) to improve parental outcomes.	IG demonstrated significant improvements in parenting satisfaction, self-efficacy and social support- but not postnatal depression. Asynchronous communication facilitated decision-making. Parents were satisfied with ‘app’.
Shorey, Yang et al. (2018)			Tailored / easy-to-access information increased confidence and satisfaction in caring for baby. ‘App’ was viewed “like a friend” between doctors’ follow-up.
White et al. (2016)	<i>Milk Man</i> ^c	Breastfeeding application targeting men to increase the support a father provides to their partner.	Suggestions for improvement tutorials / large text / personalisation. Testers rated the ‘app’ highly. The idea of a discussion form received mixed responses.
White et al. (2018)	<i>Milk Man</i> online forum		Fathers used the forum mostly during the antenatal period to seek / offer support, share experiences, connect / “join in”, and offer informational support.
	= Interventions using video	= Interventions in-person	= Online interventions
			= Interventions using ‘apps’ / SMS

Note. IG = Intervention Group; CG = Comparison / Control Group.

^a Education Intervention. ^b Support Intervention. ^c Intervention with both an educative and supportive aspect

A later study by Shorey, Yang, et al. (2018) adopted a qualitative study design to analyse the perspectives of participants from the Intervention Group of the latter RCT. One more study (Benzies & Magill-Evans, 2015) also used qualitative approaches to analyse RCT data. Two studies appeared to have all the requirements of an RCT but did not specify themselves so and lacked certain details to classify them as such (Gross, Fog, & Tucker, 1995; Pfannenstiel & Honig, 1991) – this may be due to the year of publication being prior to the formation of such terminology. Firstly, the findings of the study conducted by Gross, Fog and Tucker (1995) – testing the effectiveness of an educative parent training program – should be interpreted with caution as the prognostics of randomization were lost when the authors manually added an additional comparison group post-randomization. The results of Pfannenstiel and Honig (1991) – a study which tested the effectiveness of another prenatal educative intervention *Information about Infants (III)* – should also be interpreted tentatively, given that details of study methodology are lacking in detail. Three quasi-experimental studies appeared to measure the efficacy of an intervention but lacked random assignment (Diemer, 1997; Hudson, Campbell-Grossman, Fleck, Elek, & Shipman, 2003; Hurwitz, Lauricella, Hanson, Raden, & Wartella, 2015). Nine studies specifically identified themselves as pilot studies and 13 studies appeared to assess the acceptability / usability / feasibility of the intervention. Three studies specifically identified themselves as employing a mixed methods design and 8 studies clearly stated a qualitative approach (i.e., semi-structured interviews, semi-structured feedback questionnaires) to obtaining fathers' experiences of an intervention. A pre-test post-test evaluation design was adopted by 8 studies.

An analysis of the intervention design for each paper also lends itself to separating interventions into those which primarily support and those that primarily educate new fathers. Refer to the *Note* section of Table 2 to assist in identifying within the table, interventions that have an educative versus a supportive aspect, and those which have both. Approximately 4 papers incorporated an intervention which clearly aimed to *support* fathers of new children; approximately 10 papers incorporated an intervention which clearly aimed to *educate* fathers of new children; and 14 papers appeared to incorporate an intervention which aimed to *both* support and educate fathers of new children. However, the authors argue that providing fathers with education is essentially a form of support, considering that – as the preceding section details further – fathers have identified one of their support needs to have access to more knowledge / skills around being a “better father”, caring for their infant, caring for themselves and supporting their co-parent.

MAIN FINDINGS OF INTERVENTION STUDIES:

Interventions using video:

Interventions that primarily utilised video ($n = 4$) to deliver information, or as a means by which to communicate between fathers and healthcare professionals, were rated by fathers favourably for enhancing a father's ability to interact with their infant, to assist them to develop their knowledge, skills and confidence and to affirm their fathering skills. Video-feedback provided an opportunity for fathers to see features of their interactions with their children in 'real time', to "*see the baby in a new way... and increase understanding of development*"; fathers found this process to be "*eye-opening*" (Lawrence, Davies, & Ramchandani, 2012, pp. 67, 66). Fathers reported that flexibility of programs was an important factor to their engagement with services, and that the investment of time required, lack of privacy, and seemingly "superficial" contact were all potential barriers to engaging with a video-based intervention.

Interventions held in-person:

Interactions held in-person ($n = 6$) all had an educative purpose, such as antenatal classes, all-day parenting training programs, or dads' evenings. Two interventions also incorporated a strong supportive element. Most of the interventions were targeted at the expectant father, with the aim of preparing them for their paternal role and enhancing caregiving and interaction skills, however three of the interventions took place in the early postnatal period, with the aim of assisting fathers to better interact with their toddler / child. When rating these interventions, fathers' responses were overwhelmingly positive. Fathers reported that most of the interventions were beneficial in improving interactions with their child, their parenting style, and how they managed conflict and disagreement whilst adjusting to the circumstances. However, two studies reported mixed results. Firstly fathers who received one parent training program (Gross et al., 1995) – aimed at facilitating interaction with toddlers – did not demonstrate significant improvements post-intervention, unlike the mothers who received it. In fact, fathers did not engage with the intervention, had poor attendance and did not complete homework assignments. Moreover, fathers who attended perinatal classes (Diemer, 1997) – also aimed at increasing fathers' involvement with their child – did not demonstrate an improvement in overall coping responses post-intervention. Fathers' suggestions for improving classes held in-person included: (a) increasing the number of evenings, (b) increasing the amount of unstructured talk time, and (c) more information about infant illness, childcare / schooling, prostate cancers and the effects of a

difficult birth (Price, 2001). Benefits of 'live' classes were found for both first-time and experienced fathers, with the opportunity to talk with other fathers received well.

Online interventions:

Online interventions ($n = 6$) were rated highly if they incorporated an interactive component, such as the use of videos, graphics or an embedded discussion forum. Fathers were generally moderately, to extremely satisfied, with all online interventions, discounting the navigability and layout of *Partners to Parents* (Pilkington, Rominov, Milne, Giallo, & Whelan, 2017). Suggestions for improvement mainly revolved around increased interactive elements. Self-efficacy improved for the Intervention Group of *New Fathers Network* (Hudson et al., 2003) and that of an e-health resource targeting breastfeeding co-parenting (Abbass-Dick et al., 2017), although the latter study did not demonstrate an improvement on co-parent relationship scores. Another web-based program for educating parents on proper breastfeeding techniques (Cheng, Thompson, Smith, Pugh, & Stanley, 2003) was viewed as a valuable learning tool. Whilst it was evident that participants preferred the program that contained graphics over text-only, those who viewed the text-only program prior to the graphic program tended to rate it more highly first. Secondly, those who viewed the graphics first had a higher standard set in their mind and thus the traditional tool (text-only) seemed inferior. Fathers rated content quality of interventions highly if they found the information useful (Pilkington et al., 2017).

Interventions using 'apps' / SMS:

Studies which examined interventions using 'apps' or SMS ($n = 8$) were published from 2015 onwards. Fathers who experienced the use of a telemedicine 'app', following early discharge from hospital after childbirth, conceptualised the resource as a "lifeline" (Danbjørg, Wagner, Kristensen, & Clemensen, 2015, p. 579). Furthermore, the SMS-based support 'app' *SMS4Dads* was used as a "virtual companion" during the identity transition of expectant to actual father (Fletcher & May, 2016, p. 6). Similarly, new parents referred to the psychoeducation 'app' *Home-but not Alone* as a "friend", providing much-needed support during their transition phase (Shorey, Yang, & Dennis, 2018, p. 6). Of the interventions incorporating an 'app' or SMS mode, nearly all of them (5 out of 8) had both a supportive and educative purpose, with two solely supportive and one solely educative. All of these interventions were well-liked and accepted by fathers. Accessibility, ease of use, tailored, brief, succinct information, and interactive elements, were all aspects that fathers nominated as being preferable. The ability of 'apps' to provide a sense of postnatal security, facilitate confidence in decision-making and enhance parenting self-efficacy was evident – particularly

in studies which incorporated an interactive element, such as the asynchronous communication between fathers and healthcare professionals in *Home-but not Alone* (Shorey, Lau, et al., 2017; Shorey, Yang, et al., 2018) or the communication between first-time and experienced fathers provided by the breastfeeding discussion forum of *MilkMan* (White, Giglia, Scott, & Burns, 2018). Tentative or preliminary support was found for the use of texting as a support service in *Parent University* (Hurwitz et al., 2015); *SMS4Dads* (Fletcher et al., 2016; Fletcher, May et al., 2017; Fletcher & May, 2016); and *Stayin' On Track* (Fletcher, Hammond, et al., 2017). Suggestions for improvements to interactive elements were noted in two studies, including the addition of videos and interactive modules for an e-health application (Mackert et al., 2017), and the addition of tutorials in *MilkMan* (White et al., 2016).

STUDY AUTHORS' RECOMMENDATIONS FROM INTERVENTION STUDIES

Refer to Table 3 for a more extensive description of recommendations made by authors for each paper detailing an intervention to support / educate fathers of new children.

Suggestions for improvement included ensuring interventions suit a fathers' availability and constraints (Bourget, Heon, Aita, & Michaud, 2017; Crummette, Thompson, & Beale, 1985) and incorporating stimulating and practical play tasks to encourage father participation (Lindberg, Christensson, & Ohrling, 2009). The use of video was also outlined as being an effective way to demonstrate strategies and reach out to people with low literacy, who might not otherwise engage with written material (Pilkington et al., 2017), whilst light, conversation-driven content was recommended to enhance father engagement (White et al., 2016; White et al., 2018). It was suggested that mobile technology may help engage parents in a way that is flexible and cost-effective, and provide access to ongoing social support – recommended as potentially beneficial to fathers who derive confidence and validation from comparing themselves with others (Hudson et al., 2003). Any criticism of 'apps' concerned a lack of interactive elements (e.g., a financial planner / “push” content; Mackert et al., 2017).

Recommendations for *future research* and *methodological improvements* largely based themselves around overcoming issues with recruiting fathers (Danbjørg et al., 2015; Gross et al., 1995; Lawrence et al., 2012; Lee & Walsh, 2015; Price, 2001), obtaining larger samples (Fletcher & May, 2016; Fletcher et al., 2016; Fletcher, May, et al., 2017), determining fathers' preferences for different modalities (Benzies & Magill-Evans, 2015; Tellegen & Johnston, 2017), and employing longitudinal designs with follow-up (Shorey, Lau, et al., 2017; Fletcher & May, 2016). Specifically, randomized control trials were recommended as the next step to testing the efficacy of an intervention, following a pilot or feasibility study (Abbass-Dick et al., 2017).

Table 3.
Summary of Intervention Studies' Recommendations

Study	Intervention	Recommendations
Crumette et al. (1985)	<i>F-IIP Program</i> ^a	Programs to be offered as part of the preparatory process for parenthood, to foster paternal bonding between fathers and infant. Programs offered at a time preferable to the father.
Lindberg et al. (2009)	Videoconferencing ^b	Further research into the concepts of empowerment-disempowerment, with the mindset that telemedicine might create a need for constant support and result in dependence.
Lawrence et al. (2012)	<i>VIIIP</i> ^a	Address the general lack of interest from fathers to participate in intervention studies. Examined possible gender-specific effects that characterise paternal sensitivity i.e., include more stimulating play tasks and attempt to modify fathers' sensitive behaviours in this mode of interaction.
Benzies & Magill-Evans (2015)	<i>FIIP Program</i> ^b	Future research comparing the differences in how fathers of full-term, late-preterm, and early preterm infants gain knowledge, skill and confidence in parenting. Future research to determine what platform is best to deliver interventions (e.g., web-based / face-to-face) and fathers' preferences for receiving information individually or as a couple.
Pfannenstiel & Honig (1991)	<i>Information about Infants (III)</i> ^a	Programs for low-income, low-education fathers providing more sustained long-term supports after the birth of the infant, in order to optimize father-infant interaction.
Gross et al. (1995)	Parent Training ^a	Further studies examining fathers' motivations to participate in research.
Diemer (1997)	Perinatal / Antenatal classes ^c	Perinatal education groups supporting expectant fathers as they prepare for the birth of their children. Future research to determine if the shifting needs of fathers over time (i.e., 'retrieving information' to 'providing support') are the result of the focus of perinatal education efforts or rather reflect the natural development of expectant fathers during pregnancy.
Price (2001)	Dad's Evening ^c	Encourage attendance by enlisting the help of female partners to promote the evening. Structuring the evening and choosing a location which allows for the flow of experiences, ideas and sharing of information. Planning the evening in a way to ensure that isolated men living in stressful situations may know about and access the service.
Bourget et al. (2017)	Educational sessions ^a	Interventions that suit fathers' availabilities and constraints. Sessions which focus on the marital relationship, paternal models and the gains and losses associated with fatherhood. Training educators on the content of resources, and how to approach men and interact with them.
Tellegen & Johnston (2017)	<i>All-Day Group Triple P</i> ^a	Qualitative research to gather information from parents regarding perceived advantages and disadvantages of the different formats. Inclusion of data from other sources to avoid any limitations from using self-report.
Grant et al. (2001)	<i>FatherWork</i> ^a	Improved study design and measurement.
Cheng et al. (2003)	Breastfeeding Ed Program ^a	Breastfeeding programs translated into other languages. Future research aiming to assess how cultural factors impact the content of and access to the program.
	= Interventions with video	= Interventions in-person
		= Online interventions
		= Interventions using 'apps' / SMS

Note. ^aEducation Intervention. ^bSupport Intervention. ^cIntervention with both an educative and supportive aspect

Table 3 (cont.).
Summary of Intervention Studies' Recommendations

Study	Intervention	Recommendations		
Hudson et al. (2003)	<i>New Fathers Network</i> ^c	Using the internet to provide information and support to fathers to maintain interest and engagement. Internet programs with ongoing social support to provide fathers with feedback that their parenting skills are improving, that their efforts are appreciated and that increase their readiness to use new parenting techniques.		
Self-Brown et al. (2015)	<i>Dad2K</i> ^c	Adopting a "hybrid" approach (i.e., technology / provider) as a feasible way to engage fathers in a behavioural parent training program, to improve father-child bonding and reduce the risk of child maltreatment perpetration.		
Abbass-Dick et al. (2017)	e-health resource ^a	Evaluating the eHealth breastfeeding resource with a RCT, including more diverse populations and same-sex partners and thus increasing its generalizability as an intervention.		
Pilkington et al (2017)	<i>Partners to Parents</i> ^b	Providing parents with videos to demonstrate strategies such as communicating effectively or problem solving as a team (potentially improving its accessibility for parents with low literacy).		
Danbjørg et al. (2015)	Telemedicine 'app' ^b	Future research considering ways to overcome the difficulties of getting feedback from fathers, such as a questionnaire built into the 'app'.		
Hurwitz et al. (2015)	<i>Parent University</i> ^b	Delivery of educational content via phones allowing practitioners to reach parents consistently. Mobile technology which engages parents in a fashion that is enjoyable, helpful, flexible, and cost-effective.		
Lee & Walsh (2015)	<i>mDad</i> ^c	Researchers to leverage a close connection to community collaborators who can help with the dissemination process and overcome recruitment issues. Making 'apps' more engaging, efficient, less expensive and more widely available by delivering tailored information.		
Fletcher et al. (2016) Fletcher & May (2016) Fletcher, May et al. (2017)	<i>SMS4Dads</i> ^c	Further studies with larger sample sizes and over longer time spans providing more confidence in the suitability of SMS-based interventions or services. Acknowledging that text-messaging is low-cost and has the advantage of arriving without the user requesting it each time, whilst being available at the receivers' discretion.		
Fletcher, Hammond et al. (2017)	<i>Stayin' On Track</i> ^c	Refining and adapting the 'app' for urban and remote communities – considering preliminary support was found for the feasibility of providing mobile phone-based text-messaging and mood-tracking programs in assisting young Aboriginal fathers.		
Mackert et al. (2017)	e-health application ^a	Future research or iterations of the 'app' incorporating interactive tools, such as a financial planning calculator or "push" content, that could notify a user of a developing baby's growth.		
Shorey, Lau et al. (2017) Shorey, Yang et al. (2018)	<i>Home-but not alone</i> ^c	Longitudinal studies with long-term follow-ups, at multiple study sites with other groups who may not be comfortable with their mother tongue languages. Exploring the views of the involved midwives or health care professionals regarding the feasibility or acceptability of the program.		
White et al. (2016) White et al. (2018)	<i>MilkMan</i> ^c	Understanding how fathers used the forum to inform the development of strategies designed to engage participants. Using light, conversational-driven content to increase forum engagement and activity.		
=	Interventions with video	= Interventions in-person	= Online interventions	= Interventions using 'apps' / SMS

Note. ^a Education Intervention. ^b Support Intervention. ^c Intervention with both an educative and supportive aspect.

CHARACTERISTICS OF REVIEWS

Among the 68 papers retrieved from the search strategy, six of these were identified as 'reviews'. The review authors chose to include these in Section 1 for their specific *intervention* focus, and to further support the findings already presented. Common threads were evident, particularly in terms of study authors' recommendations for future research and improvements to interventions designed at supporting fathers with new children. Among the six reviews were: (1) a realist synthesis of social connectivity interventions (Bennett et al., 2017); (2) a systematic review of Internet-based peer support interventions for parents (Niela-Vilén, Axelin, Salanträ, & Melender, 2014); (3) a systematic review of partner-inclusive interventions for preventing postnatal depression and anxiety (Pilkington, Whelan, & Milne, 2015); (4) a systematic review of the impact of co-parenting interventions on paternal co-parenting behaviour (Pilkington, Rominov, Brown, & Dennis, 2018); (5) a systematic review and narrative synthesis of informational interventions on paternal outcomes during the perinatal period (Shorey, Ang, & Tam, 2018); and (6) a critical discourse analysis of all existing expectant fatherhood and pregnancy 'app' descriptions (Thomas, Lupton, & Pederson, 2017). Note some of the references listed below will refer to studies which are outside the scope of the existing report. If interested, the reader can find the full reference for these studies in the overarching reviews listed here.

In the realist synthesis (Bennett et al., 2017), five of the 27 papers focused specifically on connections for fathers (Devault, Gaudet, Bolte, & St-Denis, 2005; Friedelwald, Fletcher, & Fairbairn, 2005; Hoffman, 2011; Hudson et al., 2003; The University of Newcastle, 2012). In one systematic review (Niela-Vilén et al., 2014), seven of the 38 papers focused on Internet-based peer support for fathers (Eriksson & Salzman-Erikson, 2013; Fletcher & StGeorge, 2011; Hudson et al., 2003; Nicholas et al., 2003; Nicholas et al., 2012; Nyström & Öhring, 2008; StGeorge & Fletcher, 2011). In another systematic review (Pilkington et al., 2015), nine of the 13 papers included fathers as participants in at least part of the intervention for preventing postnatal depression and anxiety – as *couple-focused* (Feinberg & Kahn, 2008; Fisher et al., 2010; Gambrel & Piercy, 2014; Heinicke et al., 1999; Matthey et al., 2004; Matthey et al., 2008; Midmer et al., 1995; Milgrom et al., 2011; Shapiro & Gottman, 2005). In a more recent systematic review (Pilkington et al., 2018), nine of the 14 papers evaluated co-parenting interventions targeted at parents during the perinatal period; of the 12 trials that reported on co-parenting outcomes, 8 reported an intervention effect on at least one measure of father's co-parenting (Doss et al., 2014; Fagan, 2008; Feinberg & Kahn, 2008; Feinberg et al., 2009; Florsheim et al., 2012; Halford et al., 2010; Petch et al., 2012; Shapiro, Nahm, Gottman & Content, 2011). In a narrative synthesis (Shorey, Ang et al., 2018) of 18

studies – of which 17 were quantitatively-studied, informational support-focused interventions for fathers – seven of these were solely father-focused (Charandabi, Mirghafourvand, & Sanaati, 2017; Hudson et al., 2003; Hung, Chung, & Chang, 1996; Li, Lin, Chang, Kao, Liu, & Kuo, 2009; Magill-Evans, Harrison, Benzies, Gierl, & Kimak, 2007; Pfannenstiel & Honig, 1991; Pfannenstiel & Honig, 1995). Lastly, in a review/ commentary of ‘app’ descriptions (Thomas et al., 2017), 13 ‘apps’ focused on general information/ advice about expectant fatherhood, 9 ‘apps’ focused on general parenting tips for men, 5 ‘apps’ incorporated games, 2 ‘apps’ focused on fathering rights, 1 ‘app’ incorporated exercise tips and 1 ‘app’ touched on work-life balance.

FINDINGS AND RECOMMENDATIONS FROM SYSTEMATIC REVIEWS

Despite being largely inconclusive in findings, these six reviews highlight the issues which face researchers who attempt to synthesise support interventions for fathers, particularly around the lack of existing interventions with a sole father focus (refer to Table 4). Refer to Appendix C for a more detailed synthesis of characteristics and findings of all six reviews. Furthermore, the reviews highlight the methodological flaws commonly associated in research pursuits of this subject area, including: recruitment issues, attrition, and study designs which lack a control group, randomization, clear outcome measures, follow-up, longitudinal analysis and separation of mothers and fathers’ responses.

Table 4.
Summary of Findings from Review Papers Identified

Theme	Findings
Limited evidence	There is a lack of father-oriented social connectivity programs and evaluations
	Fathers are largely under-considered and under-represented in support programs and services (Devault et al., 2005).
	The quality of evidence from studies of co-parenting interventions is low due to inconsistency and indirectness.
	Most interventions were delivered to Western populations during the antenatal or postpartum period. Most of the included studies had “high” or “unclear” selection and performance bias. The method of delivery was mainly face-to-face. Limited father-inclusive interventions were available.
Social involvement important	Social connectivity programs tailored to fathers are important as fathers play a key supportive figure for their partners; fathers also benefit from supportive relationships (Friedewald et al., 2005).
	Fathers report preferring activities which involve the whole family – not just the father alone (Devault et al., 2005).
	A strong characteristic of interactions between fathers was the use of humour, particularly when describing the “reality of being a father” (Eriksson & Salzmänn-Erikson, 2013; Fletcher & StGeorge, 2011; Nicholas et al., 2003).
	Internet-based peer support focused solely on fathers fostered the sharing of experiences. Relief was obtained when fathers realised they were not alone with their problems (Hudson et al., 2003; Fletcher & StGeorge, 2011; Nicholas et al., 2003; Nicholas et al., 2012; Nyström & Öhring, 2008). Fathers found this support “encouraging” and “confirming” (Eriksson & Salzmänn-Erikson, 2013; Fletcher & StGeorge, 2011).
Experience is different	The experience of pregnancy / transitioning to parenthood was different for men than for women (Hoffman, 2011; Lamb, 1975).
Experience is confusing	During the transition to fatherhood, new fathers felt confused about the meaning of fatherhood and its many roles.
	First-time fathers were unsure how to balance these roles (StGeorge & Fletcher, 2011).
	Fathers felt that they were forgotten and that the general belief was that “normal” parent-infant interactions belonged more to mothers than fathers (StGeorge & Fletcher, 2011).
Barriers to access	Fathers encountered barriers when attempting to access programming: i.e., organisational resistance (e.g., a failure of organisations to focus on fathers, and lack of funding) and father-perceived barriers (e.g., fathers’ fear of judgement, and events that are mother-centric / designed for and organised by women) (Devault et al., 2005).
Internet Support	Internet-based peer support provided fathers with validation and affirmation of their fathering skills (Eriksson & Salzmänn-Erikson, 2013; Fletcher & StGeorge, 2011; Nicholas et al., 2003; Nyström & Öhring, 2008; StGeorge & Fletcher, 2011). Fathers participate in Internet-based peer-support groups to retrieve information.
Problem with ‘apps’	‘Apps’ often portrayed fathers as “clumsy, unwise and uninterested”. Whilst humour may be incorporated into the design of the ‘app’ to make it seem more appealing to male users (Ammari & Schoenebeck, 2015; Eriksson & Salzmänn-Erikson, 2013; Fletcher & StGeorge, 2011), it also risks contributing to and reproducing the social norms that describe fathers in such debilitating or dismissive ways.
Problem with programs	Prevention efforts mistakenly position fathers as contributors to maternal mental illness, in their lack of knowledge or skills to be a supportive figure, rather than acknowledging the potential for fathers to develop symptoms themselves

Table 5.
Summary of Study Authors' Recommendations from Review Papers Identified

Theme	Recommendations
More rigor	<p>Experimental studies with a rigorous design are needed to determine the efficacy of Internet-based peer support interventions.</p> <p>Mixed methods designs may be beneficial to assess complex interventions which have both an Internet <i>and</i> face-to-face element.</p> <p>Longer follow-up is needed to determine the effect of Internet-based peer support / social connectivity programs / co-parenting interventions.</p> <p>Longitudinal interventions are needed so that the efficacy of the intervention can be accurately assessed via certain behavioural outcome measures such as self-efficacy, depression, and anxiety, which may take longer to be influenced.</p> <p>Future studies should be cautious in achieving minimum bias in their research methodology so that the intervention can be accurately assessed.</p>
Encourage Participation	<p>Encouraging more fathers to participant in peer-support groups is essential, given the significance of the father's role, for example, in impacting on a mother's decision over the infant feeding method (Stremler & Lovera, 2004).</p>
Social connectivity	<p>It is important to ask fathers what kind of support groups they would be motivated to be involved in.</p> <p>Social connectivity, with its many benefits, should be valued as a primary goal of any programming for parents.</p> <p>This is an area of opportunity for nurses working with families in health care; creating environments and opportunities for social connections is a preventive strategy which may have a significant impact on a child's health development.</p> <p>Partner support should be acknowledged as an ideal target for prevention efforts targeting perinatal mood disorders, however prevention efforts that aim to facilitate both partner support and social support together may be more effective than one alone.</p>
Online strategies	<p>Considering the issues commonly associated with antenatal education classes (e.g., low attendance rates and high rates of attrition), strategies delivered online should be further explored / developed. Strategies delivered online may increase uptake of programs, reduce the impact of burden on healthcare professionals, and make support services more accessible for minority groups.</p> <p>Scalability is a further advantage of web-based strategies in that they can be delivered to more people without an increase in cost</p> <p>Future research needs to address how men examine the pregnancy and parenting 'apps' available to them, what they like / do not like, and how these 'apps' are used as part of a system of support, advice and information, while they navigate their way through both pregnancy and fatherhood.</p> <p>'Apps' may have a lasting effect for educating fathers on identity and parenthood.</p> <p>'Apps' present an important platform by which men can access parenting information and potentially feel more involved / included in the process.</p>
Fathers have problems as well	<p>Future programs should acknowledge that perinatal depression and anxiety can occur in both parents, and adopt more innovative and inclusive formats accordingly.</p>

Section 2

From the 68 papers identified, the following section summarises the 35 qualitative / mixed methods papers that use either a fathers' own voice or their preferences to describe their: (a) experiences of fatherhood (in relation to transitioning to a fatherhood), (b) experiences of support (in relation to barriers to engaging with, common sources of, and support needs), and (c) recommendations for support (e.g., mode, content, features, tone, delivery and involvement of others).

FATHERS' EXPERIENCES OF FATHERHOOD

• Positive	Best Job in the World		
• Uncertain	Fears & Concerns	Disconnect	Self-conscious
• Challenging	Work-Life Balance	Multiple Roles	Exhaustion

Positive

Best Job in the World

Fathers viewed fatherhood as the “*best job in the world*” (Benzies & Magill-Evans, 2015, p. 81), and perceived the transition to parenthood as a “*big learning experience*” (p. 82), an opportunity for personal growth, and a time to reflect on how their lives had changed since the arrival of their infant. Fathers liked to be part of their baby’s milestones, and one father stated that he looked “*forward to each new step and each new development*” and that it was exciting “*to see her at different ages*” (Benzies & Magill-Evans, 2015, p. 81). Positive sentiments of fatherhood were also expressed by a population of fathers living in Singapore (Shorey, Dennis, et al., 2017):

A sense of achievement is felt when the baby starts crying and I manage to calm the baby down and (the baby) becomes very comfortable and starts sleeping and that’s when I see the sense of joy to it and some achievement. (pp. 2990-2991)

In a study which examined the experiences of fathers who were able to stay in the room post-surgical birth (Johansson, Hildingsson, & Fenwich, 2013), being involved and staying close to one’s partner and baby facilitated their sense of becoming a father. Experiences were considered as “*pleasurable*” (p. 36) when fathers felt they could interact:

My opinion is that all fathers should be able to stay, it should be an unwritten law. If the father wants to stay and is not given the opportunity then I think he feels excluded. Becoming a fathers is something new and you are curious. It is hard to believe you are a father. For me it was about sharing, feeling, squeezing, sniffing ... If you are not allowed to be there it becomes only the mother again. (p. 36)

Uncertain

Fears & Concerns

In Benzies and Magill-Evan's (2015) study of the experiences of first-time fathers of late-preterm infants, fathers viewed fatherhood as the *"biggest job ever"* (p. 81). These fathers were concerned about *"keeping him (the baby) safe from accidents"* and *"making sure she (the baby) grows up strong"* (p. 81). This builds on findings from an analysis of fathers' blogs by Asenhed, Kilstam, Alehagen, and Baggens (2013), where it was found that several men shared a common desire to know the necessary security measures and safety of purchases made before a child's arrival: *"How do you find your way in the jungle of stroller manufacturers and retailers? Everyone says their stroller is the best"* (p. 1313).

Fathers of late-preterm infants (Benzies & Magill-Evans, 2015) were conscious of whether their child was meeting developmental milestones: *"she is gaining less weight than she should"* (p. 81). Furthermore, confidence was an issue for many fathers, with one stating *"am I doing a good job and being a good parent?"* (p. 82) and others becoming frustrated when not *"know[ing] what the baby wants"* (p. 82). Having to provide for the family was another common fear for these fathers, in regards to the stability of their jobs and finances.

Fletcher and StGeorge's (2011) analysis of fathers' posts to chat rooms on an Australian government web-site revealed the following concerns of fathers: their child's wellbeing, apprehension at the mother's childbirth pain, frustration with the mother's emotional swings, and nervousness at holding the baby. Fathers experienced apprehension for their new role regarding how to bond with their new baby or look after their partner during birth (StGeorge & Fletcher, 2011).

Disconnect

Numerous fathers shared their experiences of having difficulty bonding and connecting to their infant straight away, rather, feeling a sense of *"disconnect"* in the early stages of parenting (Katch 2012; Rominov, Giallo, Pilkington, & Whelan, 2018; StGeorge & Fletcher, 2011).

...I just didn't feel right, or I wanted to feel more ... it was more of like a duty initially.
(Katch, 2012, p. 126)

At first, I felt a little disconnected from her, but with a few baths and lots of nappy changes and holding her while she sleeps I think she is rapidly growing on me. Did this happen to anyone else? Did you feel a little disconnected at first? (StGeorge & Fletcher, 2011, p. 159)

Self-conscious

In a study which examined the relationship between infant crying and father wellbeing (Katch, 2012), the perception of crying was found to be a significant predictor of parenting stress, depression and parenting self-efficacy, whereas colic was only a significant predictor for parenting stress. Despite no father in the qualitative sample describing their infant as “fussy” or “colicky”, all but one could recall a time when their infant was inconsolable for an extended period of time, and the accompanied sense of feeling “on the edge” but not wanting to “lose control”:

I could definitely understand how at a point, especially if you were doing it on your own, you could just be so frustrated, and get to a point where you could kind of lose control a little bit. I don't know what that would look like, but I could see it happening.
(p. 129)

Furthermore, some fathers even felt a sense of self-consciousness about what others might be thinking of them (or their skills) when unable to calm their infant:

When you have this screaming baby, well it makes it sound like you're not – like you feel self-conscious that you're not being a good dad because you can't get him to stop crying. (p. 128)

Challenging

Work-Life Balance

Fathers reported experiencing issues with balancing the transition to fatherhood with obligations at work; fathers want to “*spend more time with the baby, but ha[ve] to work,*” and noted that “*finding time after working is sometimes challenging*” (Benzies & Magill-Evans, 2015, p. 82). Fathers in other studies expressed a similar sentiment, such as those in a study of new fathers accessing an online chat room (Fletcher & StGeorge, 2011):

I am about to be a first time Dad in 2 months and yes I am excited by the prospect but from what I am reading here I must be missing something ... Don't you guys have mortgages and bills to pay? (p. 1106)

Multiple Roles

Fatherhood was described by fathers in two studies as a “roller-coaster ride” (Asenhed et al., 2013; Fletcher & StGeorge, 2011). The study by Asenhed et al. (2013) analysed fathers’ use of blogs and found that participants described becoming a father for the first time as “an emotional roller coaster where the role of the expectant father is not obvious” (p. 1312). Furthermore, the perceived role of a man in pregnancy was described as predominately one of “support” – both instrumental and emotional (Mackert et al., 2017):

I feel like it's the husband's job to do whatever they can to be there, be supportive both physically and emotionally ... obviously the wife has to take time off. So the husband should, for that time at least, bring some more money ... and because obviously the food craving and stuff—you need nutrition and vitamins for two people, right? I think that those 9 months are the period when the wife will need the husband the most. (p. 722)

Numerous studies reported that fathers feel a sense of conflict in their role as caregivers, having to be both the “breadwinner” and “nurturer” (Asenhed et al., 2013; Fletcher & StGeorge, 2011; Katch, 2012; Mackert et al., 2017; Shorey, Dennis, et al., 2017; StGeorge & Fletcher, 2011). In one study by Clark (2001), the perceived role of a worker as compared to the role of spouse were negatively correlated. Furthermore, in a study that examined the relationship between infant crying and father wellbeing (Katch, 2012), two types of conflict were identified as being related to the experience and stress of parenting: society identity conflict and family identity conflict. A sense of society identity conflict was noted to manifest in fathers who felt increasing pressure to balance the roles of father, husband, friend and employee, and who experienced additional stress as a result of a perceived shift in societal expectations of them:

You know, it's just really hard ... I think it takes its toll because ... you then are really playing two roles. You're playing both the role of the sensitive father and of the traditional father that's about making a living. So, I think in some ways it's kinda unfair, you know? It's kinda being two types of persons at the same time. (p. 124)

Family identity conflict, rather, was found to manifest in fathers struggling to understand their place or role in the context of their infant. Feelings of exclusion and stress emerged as a

common theme among fathers, particularly during the early months postpartum when fathers may have perceived that they did not hold the role of 'important parent' for their infant:

Well, on an emotional level, what I find stressful is this thought and this feeling that I'm never going to be the more important parent, at least for the time being. Bottom line, at the end of the day, if the baby needs calming, soothing, feeding, clearly it's his mother he's going to want. And I know that's irrational. But that just stresses me out. It stresses me out less than it used to. There were times early on when I didn't feel like I could do anything right at all. (p. 125)

When giving advice to new fathers, many reported such comments as: "get ready to not feel as important in the family" and "...it's feeling like the second tier parents. So it's really stressful" (Katch, 2012, pp. 125, 126).

Fathers from different ethnic groups verbalised differently on their role as a father, in relation to activities such as baby care tasks or providing support to wives. For example, Malay fathers described themselves as the "breadwinner" of the family and would only participate in such activities if instructed by their elders (Shorey, Dennis, et al., 2017):

Most of the time, things are done by my wife and mother-in-law. So, for me, yes, maybe I would like to learn, but I don't think I need to ... The wife needs to be the mother of the child, while the husband needs to support the mother and child. That's the correct way. (p. 2993)

Exhaustion

When discussing the transition to new fatherhood, fathers noted a disruption of their social life and the physical exhaustion of caring for a young infant. A lack of sleep was identified consistently as one of the more difficult and challenging aspects of parenting an infant (Katch, 2012; Rominov et al., 2018; Shorey, Dennis, et al., 2017). As one Filipino father explained:

First day ... tiring, because baby usually sleeps in the morning and then wakes up around 10 pm ... and then he is awake up until maybe 7 in the morning. Sleeping pattern is not same as us, so it is very difficult... (Shorey, Dennis, et al., 2017, p. 2991).

Fathers who were parenting an infant (Rominov et al., 2018) noted a general lack of preparation for the extreme sleep deprivation and fatigue experienced, and its impact on one's physical and emotional wellbeing:

Receiving information on the emotional support side, it was not as thorough ... just that stuff of the effect the exhaustion can have on you and your mindset, and how you actually do things ... I think there was a gap there about preparing ourselves for that, and being on such a steep learning curve with actually how to care for a baby while you're in such incredible fatigue. (pp. 461-462)

Fathering was a bigger job than fathers ever imagined and was at times “overwhelming” and “tiring”; their experiences “started out being tough but every month g[ot] easier and easier” (Benzies & Magill-Evans, 2015, p. 81).

FATHERS’ EXPERIENCES OF SUPPORT

• Barriers to Support	Not knowing	Excluded	Feeling belittled
	Stigma	Privacy	Inaccessible
• Sources of Support	Co-parent	Friends	Family
	Community	Self	Other
• Support Needs	Tailored	Timing / Duration	Credible
	Practical	Accessible	Specific Flexible

Barriers to Support

The types of barriers to help-seeking in fathers varied considerably across the reviewed studies. In one study, common attitudinal barriers to help-seeking identified included: the need for control and self-reliance in managing one’s own problems, a tendency to downplay or minimise problems, and a sense of resignation that nothing would help (Giallo, Dunning, & Gent, 2017). In the same study, these barriers were found to be moderately associated with higher levels of depression, anxiety and stress.

Not knowing

A common theme across many of the studies reviewed was a consensus that fathers were open-minded to receiving support, but generally unaware of available services / resources (Hinckley, Ferreira, & Maree, 2007), or did not know where to go to find them. One father explained: “we don’t know where to go for information to help us be better parents” (Benzies & Magill-Evans, 2015, p. 82). Many fathers assumed that services were only targeted at mothers and highlighted a need for heightened awareness:

Actually, I was not aware of such classes ... If there was, maybe I can consider (attending), depending on the price, depending on the type of content, or even the scope of the program. (Shorey, Dennis, et al., 2017, p. 2991).

A sample of young Aboriginal fathers reported that they did not expect to see web content that was directly relevant to them as young Aboriginal fathers (Fletcher, Hammond, et al., 2017). One reason for a general lack of awareness proposed by Ammari and Schoenebeck (2015) is the private, anonymous nature of some support platforms, such as online forums. Pilkington, Rominov, Milne, Giallo and Whelan (2017) found that fathers in their study would not know of or use a support website if they had difficulty finding it through search engines such as Google.

Excluded

A review of studies examining experiences of fathers with support revealed a common theme of fathers feeling “*left-out*” (Benzies & Magill-Evans, 2015; Eriksson & Salzmann-Erikson, 2013; Rominov et al., 2018; Shorey, Dennis, et al., 2017), both in a formal setting (i.e., by healthcare professionals, such as midwives, nurses and lactation consultants) and in an informal setting (i.e., by a co-parent, one’s family or the wider community).

In terms of formal support, numerous fathers (Rominov et al., 2018) described how they felt that their role as a co-parent was not acknowledged sufficiently by the healthcare system (e.g., with obstetricians, midwives, maternal child health nurses, general practitioners, antenatal classes at hospital, home-visiting nurses, and infant first-aid classes), resulting in feelings of marginalisation and exclusion:

There was a little pamphlet that the hospital provided around postnatal depression. That was mainly targeted at the mum ... it did also mention that dads can get it, but that was it. There was not a lot of information or any real education about it. (p. 460)

The doctors and nurses aren’t necessarily keyed toward you as a dad ... Maybe that’s partly a social stereotype that you’re not going to be the main caregiver. (p. 460)

I definitely would have gone to classes that a hospital ran that were just for dads. (p. 460)

Originally I wanted to be in the study because I felt excluded ... I felt like less than a shadow in the room ... I wanted to get dads more noticed for their efforts. Parenting is stereotypically focused on mothers... We need to change that. (Benzies & Magill-Evans, 2015, p. 82).

Providing support was particularly important to fathers who were experiencing a partner having a surgical birth and expressed that “*being excluded*” was “*old fashion[ed]*”, “*hard*” and “*odd*” (Johansson et al., 2013, p. 36).

Fathers noted feeling excluded from the “*normal*” process of infant-parent welfare – both in terms of a perceived lack of opportunity to discuss fathering, to share fathering with others, and to participate in playgroups, and as a result of experiencing negative reactions from in-laws and the public when they were the full-time caretaker (StGeorge & Fletcher, 2011):

Unfortunately, there doesn't appear to be anything like it [a playgroup] down here, nor does there appear to be the demand for it. I gather that men have tried to start such groups but nothing happens. (p. 156)

Feeling belittled

In addition to feelings of exclusion and marginalisation, fathers often felt that healthcare professionals were belittling or demeaning them. One father, who went to *Dad 2.0 Summit* – an annual conference held for father bloggers to interact with one another and with marketers and advertisers – found it to involve a lot of “*pandering*”, where sponsors tried to influence father bloggers (Ammari & Schoenebeck, 2015, p. 1909).

More recently, a first-time father from a study by Rominov, Giallo, Pilkington and Whelan (2018) noted how parenting resources geared at fathers often adopted demeaning language in comparison to those for mothers:

A number of the books I've been reading have, which I find somewhat demeaning, have little gray breakdown boxes for fathers. As if “the man is only going to read this summary”. (p. 464)

Stigma

Commonly reported barriers to father engagement noted by practitioners were fathers' discomfort asking for, or receiving, parenting assistance and fathers perceiving that it's a mother's role to parent the child (Tully et al., 2017). Despite fathers playing a much larger role in caring for their infant, stigma is still heavy in research with fathers, as in Fletcher and StGeorge's (2011) study of online fathers:

Our nature is to be 'blokes' and traditional that has meant you 'don't ask' questions as it isn't seen as 'manly'. (Now that is rubbish, but that has been the way it has been in the past). (p. 1108)

Furthermore, the notion that fathers need to be strong and “stoic” protectors, who do not require help or support themselves, was evident:

I guess looking back now I think I could have used some support, somebody to talk to. Perhaps, like it's a kind of a guy thing – I'm not going to really seek it out. I think most – a lot of guys are like that. I'm not going to ... like I say, I'll talk to my friends and that's probably as close as you're going to go to opening up to somebody.
(Letourneau, Duffett-Leger, Dennis, Stewart, & Tryphonopoulos, 2011, p. 45)

Stigma was not only perceived within the self, but impressed on by others, such as family, the workplace, and cultural norms:

I think men and women have different experiences. It's more accepting for women to share with her female friends about this stuff and men it's not I don't think, I mean it's changing, but I still think a lot of men are stuck in the idea that you can't go out with your peers and seek information out, you're in your own solitude to figure it out and hope to God you've got the resources. (Letourneau et al., 2011, p. 45).

I am copping a lots of flak for choosing to be a SAHD (stay-at-home-dad). Especially from my own parents, they don't think it is a good idea. They feel that (my wife) needs to bond with the baby more than I do and they think the baby will get confused.
(Fletcher & StGeorge, 2011, p. 1108)

I strongly believe in the idea that there is expectation that dad is separate, that it's not their issue. Even just sick days. There's expectation that looking after the kids always seems to be the mother's obligation and, even in a relatively flexible and family friendly work place, it's still a kind of male negativity toward fathers taking the day to care for sick kids. (Rominov et al., 2018, p. 463)

Chinese fathers especially felt highly pressured to follow certain cultural confinement rituals, highlighting the issue of a generation gap; Chinese fathers felt they had to negotiate with one's elders about which practices to follow (Shorey, Dennis, et al., 2017):

I think for traditional Chinese, confinement is like ... the first month after the labouring, I mean, strictly speaking, you cannot get off the bed and you cannot open the window ... So, you cannot wash your hair at first. In Singapore, the weather (is hot) after 1 or 2 days it (hair) will smell. It's not good for me and not good for my wife and my child. So, that's something, I mean for different generations ... will have different views on ... how to take care of the baby. So, that's my challenging part. (p. 2992)

Even studies published in 2017 and 2018 still demonstrate that men perceive there to be a negative stigma attached to fathers seeking out help. To elaborate, the idea of a physical disconnect was discussed among fathers regarding perceived barriers to their involvement in pregnancy (i.e., they are not the ones carrying a baby in utero) (Mackert et al., 2017) and this was a barrier causing them not to engage. Several participants believed there were culture-based mixed messages regarding how men should be involved in pregnancy:

I think sometimes ... it's not masculine to be super involved in the pregnancy—yeah it's a cultural thing. (Mackert et al., 2017, p. 723)

[Mental health concerns] ... it's not something I'd probably confide in friends because of the stigma attached. (Rominov et al., 2018, p. 463)

The situation appeared to be worse for those living in rural, small country towns:

When we had our antenatal classes, they ... just had a blokes thing to try and get us to talk about our emotions which didn't really go that well. I think it was more the fact that because we're in such a small country town, we all know everybody, so that really didn't help. Like, there are blokes that you're playing footy against, and blokes that you work with. Nobody wants to open up to what they wanted us to in those circumstances. (Rominov et al., 2018, p. 463)

Privacy

Fathers experienced a fear of being judged in numerous ways, in regards to oversharing online regarding controversial topics, talking with other parents who may do things differently, and breastfeeding in public. Fathers in Ammari and Schoenebeck's study (2015) refrained from offering advice to other parents to avoid backlash about topics they believed to be controversial, such as sleep training, vaccinations and breastfeeding. One father felt that anything someone posts where the content related to parents would create a "fan and an enemy," so he kept his parenting posts to a minimum and as a result had "softened" his online "identity" (pp. 1911-1912).

Fathers also described a variety of ways that parents might judge one another online using general, vague, or indirect language to criticise other parent's approaches:

Like they won't mention it as in saying that you are doing the wrong thing, but they will mention it by justifying what they are doing ... that they are doing the right thing ... which by logical extension means that what we are doing is wrong. (Ammari & Schoenebeck, 2015, p. 1912)

Large class sizes were a potential deterrent for fathers participating in support programs, as in the following: “*I did attend a couple of times, but the group was so big that I found it wasn't really intimate. It wasn't a place where I felt super comfortable opening up*” (Letourneau et al., 2012, p. 75).

Inaccessible

A significant barrier to engaging with support was identified as time and availability concerns. There was a perception among participants that prenatal classes were only available during the workweek at inconvenient times (Mackert et al., 2017):

Weekends would be better than week days in terms of like one thing, so I am not taking off from work. Saturday morning I guess 12 or like may be a like a week night or non 9 to 5 typical. (p. 723)

This finding was supported by healthcare practitioners, who noted that fathers' work commitments and lack of time often acted as the primary barrier to their involvement (Tully et al., 2017). Fathers noted that the majority of perinatal services are operated during business hours, and that limited paternal leave from work restricted their capacity to engage in their parenting role (Rominov et al., 2018):

I mean, I think any first time father will say that 2 weeks after birth, you're barely waking up to the idea that anything is going on. I think a month would be much better ... preferably longer. (p. 463)

Some fathers found fathering “*stressful sometimes, especially during the work week*” (Benzies & Magill-Evans, 2015, p. 81) and lacked the energy to seek out support resources:

I had a lot of responsibility but I think because so much was going on I didn't have the energy to seek out one person to find out more about this. (Letourneau et al., 2011, p. 45)

Sources of Support

Social support is a well-established protective factor against perinatal distress (Pilkington et al., 2017). The association between social support and health dates back to studies conducted in the 1980s (Brown, 1983), however, when fathers in an infant crying study were prompted to suggest what types of support they thought would be most helpful for fathers, they had little to offer on the subject - “*I can't think of anything*” (Katch, 2012, p.134). In terms of accessing information on pregnancy and childbirth, a cross-sectional study found

that the most common sources for retrieving such information accessed by expectant fathers (in order of preference) were: (a) the midwife; (b) the pregnant partner; (c) antenatal information; (d) 'close' friends with children; and (e) the Internet (Johansson et al., 2010).

Co-parent

In a study by Brown conducted in 1985, partner support appeared to be the most important variable in understanding expectant fathers' health; wives, in fact, provided the greatest source of support for their husbands' interpersonal needs. In 2001, Clark found that husbands' psychological distance from wives decreased during pregnancy, and wives were perceived as more supportive. More recently (Katch, 2012), interview fathers revealed that they relied heavily on the co-parent as a source of support; most fathers described utilising their wives as outlets for stress reduction:

...Probably my wife. I'd say it was the greatest source of stress but also the greatest support. I mean, we talk a lot about everything... (p. 132)

Even fathers in 2018 acknowledged that their partners often took the initiative in seeking out information and then passing it on to them:

My wife spoon-fed me a fair bit, a lot of the stuff. I cannot say I would've actually been proactive enough to do it myself. (Rominov et al., 2018, p. 461)

Friends

Another common source of support for fathers was identified as friends (Katch, 2012; Letourneau et al., 2011; Majee, Thullen, Davis, & Sethi, 2017; Rominov et al., 2018; Shorey, Dennis, et al., 2017). As a result of feeling marginalised and excluded by healthcare professionals, there was a preference among fathers to seek support, for both parenting and mental health, from more informal sources:

If I was having an issue, I may have a discussion with my closest mates who were going through similar situations. (Rominov et al., 2018, p.460)

...I'll talk to my friends and that's probably as close as you're going to go to opening up to somebody. (Letourneau et al., 2011, p. 45)

Peer networks were identified as a major influence on parents' infant-feeding practices. Relationships with friends were discussed as helping parents to compare their friend' infant-feeding practices with their own actual or intended strategies for feeding. Having a shared

view on feeding was identified as a factor contributing to positive experiences such as behaviour reinforcement (Majee et al., 2017).

Family

Family was another source of support commonly cited by fathers during the transition to new parenthood (Shorey, Dennis, et al., 2017). As a stress reductor many fathers reported turning to their families for additional support: *“I talk to my parents more than I did before having the baby”* (Katch, 2012, p. 132).

First-time fathers used their own mother more often than fathers with previous children (Johansson et al., 2010). This finding was prevalent cross-culturally in a sample of young Aboriginal fathers who revealed that family played a large role in providing support during the transition to fatherhood:

I get a lot of support from my family. It's good like that – Aboriginal families are very supportive. They're very connected to one another. It's good to have support from my mum and the rest of our family. (Fletcher, Hammond, et al., 2017, p. 331)

Most Chinese fathers preferred to seek support from the elders (Shorey, Dennis, et al., 2017). Similarly, all non-Singaporean fathers (Indians, Filipinos and SriLankans) in one study, had their extended family members' visit from their home town to provide support in the early days after childbirth (Shorey, Dennis, et al., 2017).

Despite the strong involvement of family, many fathers expressed the sentiment of wanting to, or having developed, different parenting styles from their own fathers, and needing new role models. This emerged as a finding from an analysis of fathers' online blogs (Asenhed et al., 2013), fathers who were involved in the Father-Infant Interaction Program (Benzies & Magill-Evans, 2015), and a study examining father wellbeing in relation to infant crying (Katch, 2012). Fathers expressed that they did not want to make the same mistakes as their own father (Asenhed et al., 2013). One father even stated: *“worried about being a terrible father like mine. My dad was never around... [I] want to be there for my baby when he needs me...”* (Benzies & Magill-Evans, 2015, p. 81). Asenhed et al. (2013) suggested that this might imply that a new form of paternity had emerged, where expectant fathers need new male role models including a more modern parenting style. Several fathers (Katch, 2012) noted they felt they were different from their own fathers in how involved they were with their infants – but felt this was a welcome change and reflective of changing expectations in a *“greater world”* (p. 124). Interestingly, no fathers in this study referred to their own fathers as a role model or as an example of the type of father they want to be:

I think I'm more hands-on than either mine or my wife's fathers were. That's not to say that they weren't loving parents, but I think more is expected of fathers these days. And I actually enjoy it, these more increased roles, I guess as a father. And it kind of makes me, actually, a bit surprised at how much less previous generations fathers were involved in their kids' lives at a young age. (p.124)

Community

The role of the community as a source of support was particularly evident in a study examining influences on infant feeding. As well as family and friends, parent dyads recounted a variety of ways that peer networks, such as church, influenced their infant-feeding practices (Majee et al., 2017):

Yeah ... the people we go to church with, not like a big source of information, but just talking to other people, things that they do, things they feed. We get those veggie straws because someone else was feeding it to their kids. (p. 291)

Interviews also revealed that the extent to which the workplace was breastfeeding friendly had an impact on how parents perceived their own breastfeeding practices (Majee et al., 2017). Public perception of breastfeeding was identified by parents as influencing infant feeding – one that was commonly negative.

Self

As previously stated, one study found that the most common attitudinal barriers to help seeking were: (a) the need for control and self-reliance in managing one's own problems; (b) a tendency to downplay or minimise problems; and (c) a sense of resignation that nothing will help (Giallo et al., 2017). These findings suggest that many fathers will not look beyond themselves for the support they need. For example, fathers affected by postpartum depression (PPD) reported a tendency to be self-reliant, such as “*digging for information*” on the mental disorder (Letourneau et al., 2011, p. 44). This finding was supported by a later study of first-time fathers experiencing shared representation of PPD symptoms, who described seeking out information on their own (Henshaw, Durkin, & Snell, 2016):

The only information that I could do anything about was actually coming home and researching it myself online. (p. 107)

In another sample of fathers, participants described their tendency to access support resources in a reactive manner, for example, when there was a need to solve a particular problem or seek advice regarding a specific topic (Rominov et al., 2018, p.464):

I feel like I'm goi[n]g to be winging it a bit ... I probably should have done some more research ... but I'll see how it goes.

As far as I'm concerned, I'm not really learning until it actually whacks me in the face.

Furthermore, all participants in a study by Mackert et al. (2017) stated that they used electronic devices such as cell phones, tablets or laptop computers to access health information regarding illness symptoms. The most commonly mentioned sites used to search such information included Google and WebMD.

I will go to the comments section of an article. If there are a lot of comments then I will go and I will analyse, I read a lot of comments ... So I have this habit of reading comments, I know that, from those comments, this is a reliable one, this can be trusted. Yeah, this is meaningful, has common sense... (Shorey, Dennis, et al., 2017, p. 2992).

Fathers' coping behaviours ranged from healthy ones such as staying active, getting exercise, or getting out of the house, to less healthy options such as self-isolation or avoidance of social situations (Letourneau et al., 2011). In a study examining fathers' postnatal experiences, a few fathers voiced that they engaged in self-talk, talked to their babies, or smoked more when they felt stressed (Shorey, Dennis, et al., 2017).

Other

In one study (Giallo et al., 2017), formal support, provided by general practitioners and maternal child health nurses, was the source of support most preferable to fathers. Similarly, Lima-Pereira, Bermudez-Tamayo and Jasienska (2011) found that the physician / family doctor was the most popular source of information on pregnancy topics. Other studies, however, found that the midwife or nurse was the most common source of information (Eriksson & Salzman-Erikson, 2013; Johansson et al., 2010). In a sample of fathers from Singapore, formal support preferences involved healthcare professionals, especially nurses, midwives and lactation consultants (Shorey, Dennis, et al., 2017).

I cannot overstress the importance of the family physician knowing what the hell he's doing. If you don't have that, unfortunately they are the gatekeepers of the healthcare system. If they don't understand we're not getting anywhere... (Letourneau et al., 2012, p. 76)

However, first-time fathers used written information provided by the antenatal clinic, the midwife and parental education classes to a lesser extent than did fathers with previous children (Johansson et al., 2010).

Informal support commonly sourced by fathers revolved around the Internet, social media and online blogs. In a relatively recent study, the most common preference for informal support was internet-based information resources (Giallo et al., 2017). This supports earlier findings where the Internet was found to be the most popular source of information on pregnancy topics, after a physician (Lima-Pereira, Bermudez-Tamayo, & Jasienska, 2011). The Internet was found to be accessed as a source of support more frequently by first-time fathers than experienced fathers, by fathers of a higher education, and by fathers with a previous experience of a caesarean section (Johansson et al., 2010). In contrast, a different study found that the Internet was not as popular among a sample of fathers, who perceived television to be the most suitable medium for providing them with such guidance, followed by books, magazines, newspapers, radio, the Internet, professionals and DVD / video (Hinckley et al., 2007).

Specific sources of informal support reported included YouTube (Shorey, Dennis, et al., 2017) and social media (i.e., Facebook) – that latter of which was used as a means of connecting with online friends (Bartholomew, Schoppe-Sullivan, Glassman, Dush, & Sullivan, 2012; Shorey, Dennis, et al., 2017) and sharing information on health and infant feeding practices (Majee et al., 2017). Fathers used social media to compare their own parenting skills with others (Ammari & Schoenebeck, 2015), as one father stated:

[I'm] glad other parents go through (parenting problems) ... so, it's kind of like ... positive social comparison ... so it's normal to feel stressed out about stuff like that.
(p. 1909)

Blogs and online forums were described by fathers as an “exercise”, “preparation for becoming a dad” (Asenhed et al., 2013, p. 1314) and as a means to “unload” or get something “off [one’s] chest” (Eriksson & Salzmänn-Erikson, 2013, p. 65). Sharing one’s thoughts with a social support network of other fathers also engaged in caring practices seemed to work as a twofold form of support; whilst writing in the forum helped to ease concerns, receiving encouragement from other fathers was perceived as vital for the development of caregiving practices (Eriksson & Salzmänn-Erikson, 2013). Similarly, Facebook and Pinterest provided a platform for fathers to document and archive fatherhood, learn how to be a father, acquire suggestions for activities to do with their infants / children, and to access social support (Ammari & Schoenebeck, 2015).

Support Needs

An examination of fathers' experiences of support revealed that fathers have a plethora of support needs unique to them as a parenting figure. These ranged from support needing to be: tailored to their needs as fathers, timely and lasting, credible, practical, accessible, specific to unique situations, and flexible.

Tailored

One reason fathers contributed to a chat room was that they desired more access to resources and information that was tailored to their individualised needs as a fathering figure:

Being a new dad I'm interested in hearing from other dads that feel that up until now there is little information for us men ... am willing to listen to others views and advice.
(Fletcher & StGeorge, 2011, p. 1105)

Expectant and new fathers reported being interested in antenatal information about labour, birth and postnatal information about bonding and parenting (StGeorge & Fletcher, 2011). Fathers also reported that they required more information on the benefits of breastfeeding. Focus groups with health professionals (i.e., midwives working with new / expectant parents) revealed:

They (fathers) want to help, but they don't know how they can help. (White et al., 2016, p. 9)

Thinking about fatherhood was a major topic of discourse, particularly notions of wanting to be a "better father":

This is a great site. With three kids (4, 2, 7 weeks) I need all the help I can get. I think it is more important than ever to be a good father. (Grant, Hawkins, & Dollahite, 2001, p. 158)

Each parent is clinging on (to) the faint hope that they are not screwing up their kid and if they need to bitch a little about it on their Facebook page to feel good about that, I am totally for that. (Ammari & Schoenebeck, 2015, p. 1909).

Needing information and confidence during times of frustration was identified as another support need of fathers. For example, fathers expressed that support interventions which facilitated confidence in their decision making would be useful in situations such as when

“not knowing how to soothe” not “know[ing] what the baby wants” and what to do when the baby “doesn’t want to sleep” (Benzies & Magill-Evans, 2015, p. 82). Another father was concerned about ensuring he had “all the tools necessary to meet [his] child’s needs” (p. 82). Having their fathering skills affirmed and validated by a professional was one way fathers felt a support intervention helped to develop their confidence, as in a father’s response to the FIIP: “[It was] good to have outside confirmation that I am a good dad” (p. 82)

Timing and Duration

Fathers had different needs for the timing of support – and this varied across the perinatal period (Rominov et al., 2018):

One of the things that sits in my mind ... potential for problems during birth, and potential for problems straight after birth with the newborn child ... that’s the information that I find is lacking in the pre-birth phase. (p. 464)

Some fathers expressed needing support during the very early stages of pregnancy – both a time of “excitement” coupled with “worry”:

...when you find out that you’re pregnant, what sort of information and support is available? People do not talk about it, you’re not meant to say anything. That was a struggle for me. (p. 462)

Other fathers noted that many of the available perinatal resources and support services focused predominantly on pregnancy and birth, and discussed the need for additional resources in the early stages parenting an infant:

After the first couple of months with the baby ... it’s all really exciting. There probably comes a time when things maybe settle down a little bit, but it’s still quite tough ... potentially maybe at that point you could have extra support for dads. (p. 464)

Credible

A desire to know what resources were reputable was an important support need for fathers, mainly due to fathers feeling like they were living in the ‘Information Age’ – which, whilst providing many opportunities, could also create conflicting messages and overwhelm fathers (Rominov et al., 2018):

There are just so many things out there, which is a good thing, but also there is so much out there that you are like, "Which ones do I go to? Which ones are reputable?" For a first time parent, it can be a little bit overwhelming. (p. 462)

Fathers felt the need for more formal and credible informational support on baby care tasks. Fathers often solely relied on the comments sections of YouTube to judge the reliability of those videos:

It will be good if I could connect to professionals (after hospital discharge). I know that the information is provided by real professionals, like, doctors and (nurses). So, at least it's information that's reliable. So, I do not have to worry about, actually, is this true or not? I don't really have to think so much. I can know that I can trust the information. (Shorey, Dennis, et al., 2017, p. 2993)

Practical

Fathers expressed that they wanted to be prepared for fatherhood with more practical and realistic advice, so that their expectations could be appropriately met:

It would be better if there is an actual baby ... I would prefer the training (antenatal classes) to be realistic, like they are real life scenarios. I would not attend any classes that are just theory-based. I can't relate to it. (Shorey, Dennis, et al., 2017, p. 2990)

Throw out the parenting books. We read loads of them. All were pretty much useless. They are full of perfect well behaved children by experts who knew nothing about our child or us. (Fletcher & StGeorge, 2011, p. 1108)

In an analysis of an online forum for fathers, 'activities' was found to be the most frequently engaged topic (Eriksson & Salzmann-Erikson, 2013). Furthermore, these fathers reported that they needed practical advice regarding an infant's sleep, food, weight, social and physical development.

In a more recent study (Rominov et al., 2018), fathers expressed a number of areas that they felt unprepared to manage. As previously stated, fathers reported that they were unprepared for the extreme sleep deprivation caused by parenting an infant and the subsequent physical and emotional response experienced:

It's the constant broken sleep. You just feel it in your chest, like you're just melting when you're so tired. Yeah, probably needed little bit more detail around that, so we could've been prepared for it a bit better. (p. 462)

Several fathers also indicated their desire to be better prepared to manage the changes they might experience in relationship dynamics (both in the couple and extended family relationship):

It would have been good to know that support that would be there for a father that has had his wife / girlfriend to himself for so long and then all of a sudden they've got a baby that shifts the attention ... I had a little bit of an issue with it, not resentment or anything but ... it does change quite a lot. (p. 462)

The emotional and mental changes that can occur during the perinatal period was another area in which fathers felt unprepared:

You go for a run to stay fit, to maintain a basic level of fitness, but for your mental health, it's not as if there is any maintenance, is there? It's only when there is an injury that people would seek something out... (p. 464)

Accessible

Having access to support, whether it be a friend, co-parent, online virtual space, program or service, was identified as valuable to fathers during the transition to fatherhood. When probed to discuss their own needs, fathers wanted someone to share the burden with:

It's like this big pressure. This massive amount of weight of things, thought, and feelings and just by expressing them to another human being, it was like giving a lot of it away ... I don't know, it's a weird analogy I guess. It's like here, take this. (Letourneau et al., 2012, p. 74)

Gaining insight from friends into how they coped with similar experiences was one way of accessing this vital support:

Just to meet people who were saying, yep I was bad. And your situation was nothing like mine and mine is nothing like yours but I made it. Whenever she could find one of those people it was like a hallelujah day. (Letourneau et al., 2011, p. 44)

Considering the finding that many fathers felt there were not enough resources to support or educate them, or any recognition of their feelings during the perinatal period, StGeorge and Fletcher (2011) suggested that – in addition to increasing access to father-focused antenatal education – *virtual* spaces (i.e., chat rooms and discussion forums) may provide an appropriate meeting place for communication between fathers, both first-time and

experienced. Generally, fathers expressed a desire to have their role as a father recognised by perinatal resources and support services (Rominov et al., 2018):

I guess if you're attending them [antenatal appointments] as a couple ... it would be good if it was more of an inclusive thing, if I mattered too. (p. 463)

One father reported that it was crucial to have parenting programs that target fathers and teach positive parenting skills, especially for fathers who did not have relationships with their own biological father (Self-Brown et al., 2015):

I find that the Dad2K program is very fun and interesting, got a lotta good wisdom and its purpose, I think, is to make a father ... into a better dad, get him the information that he's gonna need to raise his child. (p. 150)

Specific

Needing additional support for when things did not go to plan was discussed by several fathers (Rominov et al., 2018), for example:

My wife has had severe morning sickness. For me, it probably would be worthwhile having some support, especially going through a really tough pregnancy. I know there are people who love being pregnant and the whole family loves it, but not us! It's great that we know there is a baby coming, obviously, but during it, it's pretty brutal. (p. 462)

A lack of information and support about alternatives to breastfeeding, and how to support their partners in the process, was identified as a major gap for fathers who unanimously agreed that whilst breastfeeding is the ideal situation, there are several factors that can make it unmanageable:

When our son was born, the breastfeeding didn't quite kick off, and I had to go to the chemist to get the express stuff, and the bottles, and all of that. Hospital staff—couldn't you have just had a brochure or pamphlet, or as part of the classes to tell us that we should go and get all of that stuff beforehand just in case? That really would've taken a lot of the stress out of it...I didn't know what I was doing. (p. 462)

Fathers who experienced issues bonding with their infant initially – a common finding – also expressed the need for specific information and support in the area:

I think from a male perspective, it can take a little bit of time to build that bond with your baby. I guess more awareness, preparation, or letting the dad know that

potentially, you are not going to have that bond the same as the mother does initially, and it can potentially take a month, or 6 months, or maybe even longer. (p. 462)

In Henshaw, Durkin, & Snell's (2016) study, fathers whose partners had high Edinburgh Postnatal Depression Scale scores consistently indicated that they lacked the knowledge to support their partner and could not find the appropriate resources to gain advice:

...everything was dedicated to her. There was nothing for me that I could see. (p. 107)

This sentiment was echoed in another study examining postpartum depression (Letourneau et al., 2012):

Knowledge of what the father might experience during the time if there is postpartum depression and those sorts of things, I'd like to hear a little bit more [about it], not after the fact but during the fact. I looked into more of those signs and symptoms, but it was all to see what I could do to help my wife at the time. (p. 74)

Flexible

In response to results which revealed that fathers were not as involved as they wanted to be, the authors felt that this may speak to a growing desire in fathers to have paternal leave and greater flexibility at work (Benzies & Magill-Evans, 2015)

Work support would be another area that would be helpful. Having time off to assist with the home situation (PPD). Taking time to make sure that all the support pieces are in place. Probably an area that needs to be worked on and developed. (Letourneau et al., 2012, p. 74).

Study Authors' Recommendations for the Attitudes / Behaviours / Actions of Healthcare Professionals

Health care professionals should:

- Consider pregnancy as a “*teachable moment*” (Da Costa et al., 2017; Everett et al., 2006) – as a time of major transition, characterized by a potential for learned behavioural change (Brown, 1983).
- Demonstrate, encourage and facilitate sensitive, responsive infant care regardless of risk factors (Wynter, Rowe, Tran, & Fisher, 2016). Real babies should be used in perinatal parenting educational programs (Shorey, Dennis, et al., 2017).
- Not neglect expectant fathers by excluding them in antenatal discussions. Instead, midwives should ensure fathers feel comfortable and involved (Asenhed et al., 2013).
- Critically monitor the field and update themselves on support activities taking place in these kinds of forums, which are an important source of support for some fathers (Eriksson & Salzmänn-Erikson, 2013).
- [General practitioners] should discuss mental health with fathers in the postnatal and early parenting period (Hinckley et al., 2007), given fathers' preference for receiving support from the family doctor.
- Educate new parents about postpartum depression (PPD), normalise the highly stigmatising mental health issue, and include fathers in treatment planning for mothers affected by PPD (Letourneau et al., 2011).
- Aim to improve on co-parenting feeding practices (Majee et al., 2017)
- Encourage partners to attend perinatal appointments together to give health professionals more opportunities to engage fathers, and which will address the desire of fathers to be more included (Rominov et al., 2018).
- Involve fathers in educational programs (Shorey, Dennis, et al., 2017) given that fathers who prepared for childbirth in antenatal classes more often engaged in the supportive role, provided nursing care and carried out instrumental monitoring during each stage of childbirth (Sioma-Markowska, Poreba, Machura, & Skrzypulec-Plinta, 2016).
- Take advantage of the ease of sharing hyperlinked information on Facebook (Bartholomew et al., 2012).
- Have a list of preferable websites for obtaining pregnancy and childbirth information, whilst ensuring parents have a chance to reflect upon and discuss information that they have retrieved themselves from the Internet (Johansson et al., 2010).

Study Authors' Recommendations for Healthcare / Policy Implications

Healthcare providers:

- May benefit from viewing pregnancy as a “*teachable moment*” for fathers; men may be more open and interested in interventions and receptive to information designed to promote theirs and their family’s well-being and health (Da Costa et al., 2017, p. 11; Everett et al., 2006, p. 204).
- Should promote (1) antenatal classes as an optimal form of preparation for active participation in childbirth; and (2) continued education in a delivery room (Sioma-Markowska et al., 2016) particularly for first-time fathers (Xue, He, Chua, Wang, & Shorey, 2018).
- Should place emphasis on postpartum depression screening for fathers (Katch, 2012)
- Could assess fathers for mood disorders during the postpartum period, particularly if their partner is depressed (Letoumeau et al., 2012).
- Should collaborate with community organisations such as community action agencies, health departments, and hospitals in designing and implementing health education campaigns and in creating Baby-Friendly communities (Majee et al., 2017).
- Need to promote their resources and supports to actively engage fathers in order to overcome the tension found between fathers wanting to be more included and their tendency to “*wing it*” and seek support reactively (Rominov et al., 2018).
- Should offer perinatal support services after business hours or via telephone to engage fathers and overcome barriers to father involvement (Rominov et al., 2018).
- Expand childbirth services to include fathers and increase their involvement in childbirth processes; provide a space where groups of fathers can informally share information, identify common perspectives and communicate support (StGeorge & Fletcher, 2011).
- Facilitate specific opportunities for fathers to broadly discuss different mechanisms of support and create spaces for the sharing of intimate information (White et al., 2018).

FATHERS' RECOMMENDATIONS FOR EFFECTIVE SUPPORT

• Mode	In person	Individual vs. Group	Platform
• Delivery	Location	Facilitator	Timing Duration
• Content	Useful / Relevant	Credible	
• Features / Functions	Interactive	Ease of Access	
• Tone	Light-Hearted		

Mode

In person

The biggest advantage fathers reported for face-to-face meetings was the greater personal connection they offered, with many fathers indicating their preference for this type of support (Letourneau et al., 2012). Some fathers suggested that support groups run by an experienced father, or a social group for new fathers, would be ideal (Katch, 2012):

The one thing that really did help me was the class that we took ahead of time. They were really hands-on, and they really encouraged fathers to come along, or just to come with. So maybe if the hospitals would offer ... a group where men, just fathers, could go and talk about it or maybe even pair them up with a father who is just ahead of them, kind of like a mentor, I guess. (p. 134)

Singaporean fathers recommended that focus groups with other fathers would be beneficial as future help / support (Shorey, Dennis, et al., 2017):

Maybe you can have other people (other fathers) sharing their experiences and you can put up a list of frequently asked questions. That will be helpful. (p. 2993)

Another father suggested an informal gathering, such as going for a walk with other fathers, but this was a unique case (Fletcher & StGeorge, 2011):

... What about organizing weekend walks around the city or botanic gardens or even local areas for guys in the same area? Exercise, bonding with your children and getting some bloke time in without the better half keeping tabs on you! (p. 1105)

Individual vs. Group

In fathers prompted to share their support needs for an intervention focused at parents affected by postpartum depression (PPD; Letourneau et al., 2012), both group and individual support services were desired. Large class sizes were a potential source of fathers' reluctance, as in the following:

I did attend a couple times, but the group was so big that I found it wasn't really intimate. It wasn't a place where I felt super comfortable opening up. (p. 75)

Platform

Although the Internet was not preferred as a method for accessing support generally for fathers affected by PPD, all of the fathers agreed that it would be a suitable method for receiving information about PPD and to help them identify regional resources. One father stated, "one of the things if you're going help dads and probably the cheapest is a Web site. Putting the info on it and dads will find it." (Letourneau et al., 2012, p. 77).

Almost all fathers (Shorey, Dennis, et al., 2017) recommended using information technology such as mobile-health 'apps'. Reasons that fathers enjoyed the use of an 'app' included convenience, being able to view content repeatedly and connecting with healthcare professionals and other fathers:

A mobile app will be useful ... but information in the app has to come from professionals ... I could not find an app ... I never see any app like helping for the infant. Do you know any app? (p. 2993)

Much dialogue surrounded the purpose of a support chat room – some fathers felt the space should be a site for interaction with other men only (StGeorge & Fletcher, 2011):

I see this Dads' forum as an opportunity for guys who may not otherwise feel comfortable discussing these issues. My concern is that if guys who are hesitant or cautious feel maybe even less likely to post if they feel they aren't "with the guys". (p. 158)

Others noted the benefits of including mothers in discussion, who they felt had particular experiences in child care helpful to men:

As you rightly put it, it is a public forum and although there is the different sections I find that gaining helpful information from where ever to help me become a better father

and carer for our child is paramount. There needs to be a balance and as there are more females as the primary carer for a child I think it is important to listen, read and learn from those that have been doing it for decades. There are many posts in the 'Mums' section that have answered the exact question I had. (p. 159)

To prolong a father's visit to a website, fathers suggested that they need to have a “*desire to improve knowledge*” and to “*experience the website as rewarding*” (Da Costa et al., 2017 p. 7). To increase the chances of them revisiting the website, personal commitment of the father was identified as crucial.

Fathers who experienced videoconferencing – after being discharged early post childbirth – said that it should be voluntary, as some found it “*strange*” and “*superficial*” (Lindberg et al., 2009, p. 362). Other fathers indicated that an interactive talk show would be their preference to receive information, followed by a documentary (Hinckley et al., 2007). Another popular mode to receive support was nominated as the telephone, however, some fathers favoured an intervention program that incorporated all three modes of face-to-face, telephone, and online (Letourneau et al., 2012).

Delivery

Location

Preferences for the location of support varied across fathers – this being potentially influenced by mode of support. Fathers who experienced the use of videoconferencing (VC) with midwives as a support in early discharge after childbirth (Lindberg et al., 2009) assumed that meeting the midwife via the VC sessions was less of a threat to their privacy than having the midwife on a home visit:

I think that it is almost more worrying when someone is coming home to you than when they look at you via the VC. (p. 362)

However, fathers who participated in the Father-Infant Interaction Program (FIIP; Benzies & Magill-Evans, 2015) found the home visits “*very convenient*” and “*found comfort in knowing [they] could ask questions regarding the baby*” (p. 83). One father who experienced the use of telemedicine following early postnatal discharge found that “*it was actually better to do it when [they] came home in peace and quiet*” (Danbjørg et al., 2015, p. 579). For one-on-one support, fathers affected by PPD also favoured meeting in their homes over a community centre (Letourneau et al., 2012), as it was felt that talking about personal matters at home would be easier than doing so in an unfamiliar place. A home visit also took the stress out of

having to drive to community and medical centres. For group support, however, fathers were almost unanimously in favour of a community setting over the home.

Facilitator

Fathers affected by PPD (Letourneau et al., 2012) posed arguments supporting both peers and professionals as facilitators of support. Many fathers wanted their facilitators of support to have a combination of personal and professional experience and to feel comfortable divulging deeply personal information:

I don't think I could meet somebody and half hour later be telling them about personal matters, I'd need some get acquainted time before I could share something on a deeper level. At least when I'm in the middle of it. It's easier now. In hindsight, I could do that, but at that time I don't think I could share anything, you're so clos[ed] off and protecting yourself because you don't know what the hell is going on. (p. 75)

Fathers who participated in the FIIP (Benzies & Magill-Evans, 2015) liked having a healthcare professional as the home visitor; another father even suggested preference for a “male home visitor” (p. 83).

Timing

Across the various studies which asked fathers to rate their preferences for timing of support, there was considerable variation in response. Fathers in one study confirmed four months as the appropriate time to start a program (Benzies & Magill-Evans, 2015). This was supported by fathers in another study (Rominov et al., 2018) who noted the need for additional information in the early parenting period – not just during pregnancy and birth:

There probably comes a time when things maybe settle down a little bit, but it's still quite tough ... potentially maybe at that point you could have extra support for dads. (p. 464)

When PPD presented as a possibility, some fathers thought that interventions should be implemented from one week to several months post childbirth, whereas others felt that treatment should begin as soon as symptoms first become apparent (Letourneau et al., 2012). Many fathers felt that education for PPD should begin prior to childbirth so that they could be taught about the potential signs and symptoms to observe in their partners from an early stage: “If the information is there early on then dads can make more informed choices” (Letourneau et al., 2012, p. 77).

In a study of Singaporean fathers (Shorey, Dennis, et al., 2017), fathers recommended that father-focused educational interventions should occur in the two weeks post-delivery, accompanied by continuous care from doctors and nurses. Similarly, fathers who had access to the *Home-but not Alone* 'app' for four weeks after discharge from hospital felt it acted as a support mechanism between the doctor's follow-up sessions:

I really feel that ... not to worry ... too much. Because you can only meet the doctor at [a] certain point in time, right? So, in the meantime, we didn't have any information. So we were glad that we had the message. (Shorey, Yang et al., 2018, p. 6)

Generally, experiences of fathers' with telemedicine post early discharge (Danbjørg et al., 2015) revealed that timely information gives a feeling of control, support and reassurance:

All that information, no one can retain it, if you are on your way home. It is an advantage that it comes continually. (p. 578)

Fathers have stipulated that a program for expectant fathers should be presented at a convenient time (Hinckley et al., 2007). Delivery of *mDad* to users was rated highly for its accessibility and availability whenever and wherever fathers had the time and / or interest. The specific timing of messages – which was Thursdays and Fridays – was rated as highly favourable; fathers reported that the messages helped to plant the seed for things to do over the weekend when they had the most family time (Lee & Walsh, 2015). This supports an older finding (Grant et al., 2001) where it was reported that fathers predominately visited *FatherWork* (a support web-site) later in the afternoon, on weekdays.

Duration

Responses of fathers in relation to their preferences for length of support suggested that support needs to continue long after pregnancy, childbirth and the immediate stages post-delivery. Fathers in the four-visit intervention group of the FIP suggested another visit at 12 months. One father even said: "*a full year of visits would be great ... like having a teacher come once a month to help guide*" (Benzies & Magill-Evans, 2015, p. 83). Extending the duration of the 'app' to allow for important developmental milestones was also recommended by participants evaluating the mhealth 'app', *Home-but not Alone* (Shorey, Yang, et al., 2018):

...the first six months ... Because it's the first vital ... you know ... stages! After that, I think they can start crawling, recognising you proper[ly], so it shouldn't be so much of a problem. (p. 7)

An intervention that did not take up too much time was valued by fathers:

It took five minutes maybe to look through almost the entire thing, so it wasn't a time-suck and it kind of covered all the bases. (Mackert et al., 2017, p. 723)

Content

Useful / Relevant

To increase the chances of fathers revisiting a support website, regular new content was rated as important (Da Costa et al., 2017). In a study of antenatal class fathers who evaluated email and web-based information around pregnancy, childbirth and fatherhood, popular educational modules included fathering across the lifespan, fathering teenagers, and modules on infancy and the toddler years (Fletcher, Vimpani, Russell, & Keatinge, 2008). This was supported by another study, in which questions most commonly submitted to a web-based support site regarded infants, newborns and toddlers (Mindell, Leichman, Puzino, Walters, & Bhullar, 2015). Fathers in the latter study asked more questions about night waking and bedtime problems than other topics. However, almost none of fathers asked about sleep training, compared with mothers. The most popular topics for fathers for a web-based support (Fletcher et al., 2008) were those that related to father's direct interaction with the infant (e.g., baby games and bonding). The least popular topics were breastfeeding and sex after birth.

Other useful and relevant topics related to caring for one's co-parent. In a study examining patterns of use of the Internet as a source of health information in parents of antenatal education, men reported more frequent searches on childbirth without pain, information about healthcare, care of women after childbirth, relationships / sexuality / emotional support, baby names and stages of childbirth (Lima-Pereira et al., 2011). Men have commonly expressed their desire for more practical tips for helping their partner (Fletcher et al., 2008; Hinckley et al., 2007; White et al., 2016).

For a sample of young Aboriginal fathers using *Stayin' On Track*, the most popular links were 'Routines: Aboriginal and Torres Strait Islander parents', followed by 'Baby talk – YouTube video'. The link for 'Crying' was only clicked on once and those for 'Bonding for dads – video' and 'Postnatal depression (PND) and women' received no clicks (Fletcher, Hammond, et al., 2017).

Fathers also reported wanting more information on certain basic childcare skills such as handling the infant, changing nappies, feeding and bathing (Hinckley et al., 2007), as well as

infant bonding and attachment: “*more awareness, preparation, or letting the dad know that potentially, you are not going to have that bond the same as the mother does initially...*” (Rominov et al., 2018, p. 462). When examining how fathers engaged with a prenatal health ‘app’, the nutrition content was the most clicked on module, followed by the financial preparation (Mackert et al., 2017).

A mHealth ‘app’, *Home-but not Alone* (Shorey, Yang, et al., 2018), was rated positively for being a good informational resource, and for catering to a local context and new generation parents. However, fathers recommended that its educational topics should be widened to be applicable to the various needs of different parents (Shorey, Yang, et al., 2018):

...but, now that it is my second baby, it might be useful to have some topics for parents that are already parents. (p. 7)

The content of the ‘app’ *mDad* was found to be interesting, useful, and relevant to parenting experiences across a broad cross-section of both first-time and experienced military fathers (Lee & Walsh, 2015):

I love the app. At first I thought it would be more useful for first-time fathers, but it turned out to be so helpful even though I already have kids – it reminded me all kids aren’t the same and helped me try new things. (p. 116)

Positive feedback was also generated from experiences with the *Dad2K* program, in regards to its content (Self-Brown et al., 2015):

This information will be very useful, like, the skills you learn, it helps ... basically the PAT (Planned Activities Training) skills, like most people scold their child ... and look at minor behaviour ... but it’s something that you shouldn’t do because, if you follow the steps and the skills, like you’ll see that you don’t really have to scold your child or none of that... (p. 150)

... learning rules and consequences (excuse me), preparing in advance, and explaining beforehand. I think those things really helped out ... the instructional video was pretty good too ... In my opinion the Dad2K program is basically giving a dad like me or any kind of dad (no matter how good you are) the skills that are shown to work, skills that help work, and give you some (skills) if you don’t have any at all... (p. 150)

Fathers in both the intervention and comparison groups of the study conducted by Benzie and Magill-Evans (2015) wanted a program that helped to build up their skills and confidence: “*comments during first visit about how she (the infant) learns and different ways*

to play very helpful ... [and I] carried those through into ongoing learning and playing opportunities” (p. 83).

Content quality of *Partners to Parents* (an online intervention for enhancing partner support and preventing perinatal depression and anxiety) was rated positively in relation to the usefulness of the information (Pilkington et al., 2017): *“I’d certainly recommend this site to dads” and “this is good stuff for dads I think. Because we often forget this stuff”* (p. 49). Negative comments included that it was *“too academic”* (p. 49). Suggestions for improvement included: improved navigation, simplification of content to improve readability, and the inclusion of ‘real-life’ examples making use of quizzes and interactive elements.

Midwives advised that the content of the ‘app’ *MilkMan* (White et al., 2016) should include information about postnatal depression for fathers and to focus on the message that every breastfeeding is a success. In the online forum which was later developed and embedded into the ‘app’ (White et al., 2018), the content was rated favourably:

Hadn’t thought about dad / baby skin to skin. It makes sense that it could benefit the bonding experience. (p. 7)

In addition to topics on bonding, *MilkMan* also includes content around breastfeeding in public. White et al. (2016) observed how such a topic on a forum provides an opportunity for the normalisation of public breastfeeding, as in the following comment from a father poster:

We have had no issues. Makes me think it really isn’t an issue. (p. 7)

Credible

Previously identified as a support need, fathers expressed their preference to receive support information and services from a reliable source. Fathers indicated they would not use an intervention if they did not think the information was credible (Pilkington et al., 2017) and wanted to know that support resources were reputable and scientific-based (Da Costa et al., 2017).

There are just so many things out there, which is a good thing, but also there is so much out there that you are like, “Which ones do I go to? Which ones are reputable?” For a first time parent, it can be a little bit overwhelming. (Rominov et al., 2018, p. 462)

Study Authors' Recommendations for Support Service Content

Content developers should generally:

- Aim specific information at fathers regarding the consulting and supporting role (Henshaw et al., 2016; Mackert et al., 2017) – considering that the perceived role of a man in pregnancy health is often one of both instrumental and emotional “support”.
- Organise education around three key topics: (a) what to look for (symptoms), (b) how to empathically initiate / respond to a discussion about symptoms and treatment, and (c) how to facilitate self-care and formal treatment for their partner (Henshaw et al., 2016).
- Ensure their presented information is evidence-based (Shorey, Dennis, et al., 2017).
- Include a list of scientific resources which are used to develop an electronically delivered intervention, as well as the qualifications of the team who help devise the intervention (Da Costa et al., 2017).
- Adopt a light, conversational tone to encourage forum contribution (White et al., 2018).
- Address risk factors for new fathers based on their common clustering e.g., one module could address smoking and problem drinking, while another module could intervene upon exercise, weight management, and nutrition behaviours (Everett et al., 2006).

Content developers should specifically:

- Focus on providing clear, comprehensive paternal depression (PD) criteria addressing areas of uncertainty or misinterpretation (e.g., education should clarify that thoughts of self or infant harm are rare and not a defining feature of PD or that postpartum mood changes often include symptoms of anxiety; Henshaw et al., 2016).
- Promote self-care in fathers and detection of PD, as well as provide information for fathers as supporters (Henshaw et al., 2016).
- Provide some basic knowledge of infant abilities, such as an infant being intentional in behaviour (i.e., crying in order to get something), provide opportunities for fathers to learn how to interpret infant behaviour and build confidence in caregiving skills (Katch, 2012).

Features / Functions

Interactive

The interactive elements of *mDad*, such as shared participation in the intervention with a co-parent and being able to virtually track a child's development, were rated positively by fathers (Lee & Walsh, 2015). Feedback on an e-health application for engaging men in prenatal health (Mackert et al., 2017) revealed that – for visual foetal development metaphors – the majority of participants preferred fruits and vegetables images over sports-themed images. Furthermore, participants enjoyed the graphics and stated they were easy to understand, as well as liking the overall “*feel*” of the application. Features of *Home-but not Alone* (Shorey, Yang, et al., 2018) were rated positively for incorporating audio, video, push notifications and a discussion forum. The push notifications used in *MilkMan* (White et al., 2016) were also rated positively by fathers in focus groups, although some participants mentioned they should be used “*judiciously*” and that the content should be relevant:

I think the lesson really is notification fatigue. You know some people like them, some people don't. I suppose if you got far too many you just become disinterested and that can actually be more dangerous than not getting a notification. (p. 8)

Whilst an embedded discussion forum to facilitate connection between fathers was rated as a positive feature elsewhere, the idea received mixed responses with *MilkMan* (White et al., 2016). The idea was met with enthusiasm by some fathers, whilst others voiced concerns about not being able to trust the source, preferring communication in-person and feeling that information shared on forums (sometimes untrue) can be alarmist and cause unnecessary distress.

I don't know, I wouldn't talk to a stranger for starter on an app and then I mean you go, we go to barbeques and friends' house and their kids are ratbags or this and that and you can't tell your mate how to look after their kid, it's their kid. You don't know what they've been through the night before, you don't know what they've eaten the night before, so I wouldn't ask someone for advice on my child in that sense. (p. 9)

We stopped trusting anything that wasn't from a doctors 'cause we got 50 opinions and my wife ended up freaking out. (p. 9)

Others found the use of a discussion form as part of an ‘app’ gratifying (Shorey, Yang, et al., 2018), as it created a smooth transition from the hospital setting to home, connected mothers and fathers with other parents and any advice from informal figures was either

confirmed or corrected by a healthcare professional. To increase the chances of a father revisiting a support website, fathers stipulated that there needs to be the opportunity to post questions to a health professional (Da Costa et al., 2017).

I think what is good about the app is [that] you have the mothers and fathers for users, user-based answering the questions, but then in 9 out of the 10, the moderator [midwife] comes on and either clarifies all the answers other people [have] given, and adds an extra professional part as well. (Shorey, Yang, et al., 2018, p. 6).

Parents who utilised the interactive component of *Home-but not Alone* (i.e., the discussion forum) noted that it helped them to put their problems into perspective by identifying that other parents were going through very similar situations (Shorey, Yang, et al., 2018):

So when we have this app and you know there's another parent ... the person answering is really answering related directly to the question. And the question is linkable to us ... We felt others are also going through the same things ... So I think that was the most helpful about the app. (p. 6)

In another study (Eriksson & Salzman-Erikson, 2013), an online forum provided fathers with an opportunity to network with other fathers and share experiences of caregiving – providing a crucial link to the “*outside home*” (p. 66).

Ease of Access

Ease of access and use was another recommendation made by fathers for support interventions and services directed at them. A clear navigation structure was rated by fathers as very important (Da Costa et al., 2017); if an ‘app’ was quick and easy to use, this was often rated highly by users, such as those who experienced *MilkMan*:

...if it's something quick and easy that ... tells me that what I'm seeing in front of me is correct [I'm more likely to use it]. (White et al., 2016, p. 9)

Home-but not Alone was also rated positively by users for its ease of access, being user-friendly and facilitating the recapping and recalling of essential information:

...because, when you learn at the hospital, you only see [it] one time. If you watch the video, you can recap. (Shorey, Yang, et al., 2018, p. 5)

However, fathers recommended that the ‘app’ be improved to reduce technical hiccups and enhance technical aspects (Shorey, Yang, et al., 2018).

Fathers expressed they wouldn't use an intervention if they weren't aware of its existence, if they had difficulty finding it through search engines such as Google, or if the website required mobile device compatibility (i.e. only accessible via a tablet or smartphone) (Pilkington et al., 2017). Aspects such as having to fill out personal information or pay to access a resource were considered deterrents.

Men expressed their desire for practical tips for helping their partner. Information that was brief and specific (Lee & Walsh, 2015), delivered in short, summarized formats, including bullet points and checklists, was rated as ideal, as well as access to more detailed information via drop-down links (White et al., 2016). Features of an 'app' perceived favourably by fathers included brief messages – considered more useful and easier to understand than long books or dense websites:

I want bullet points and if I want to read into it more I'll look into it more if I've got the time. (White et al., 2016, p. 9)

Checklists, perhaps a list of [reasons why] my baby won't stop crying and then people could maybe leave suggestions. Doing an up-voting, down-voting vetted type system. Say "try this top answer; this worked really well" [or] "that didn't work, give me another thing on the list to try." (White et al., 2016, p. 9).

I get sick of apps that send too much information or send things too often. This app didn't send too much, so I never got tired of it. When I saw I had an update, I wanted to see what it was, and I went straight into the app. I always found information that was relevant for me and my son. (Lee & Walsh, 2015, p. 116).

A study conducted with Aboriginal fathers (Fletcher, Hammond, et al., 2017) also found that web content that was text dense or did not have appealing images or design did not engage them, and they quickly clicked to the next page. Healthcare professionals have also confirmed this tendency in fathers (White et al., 2016):

Are you using dot form? Because I just find, they won't read a whole big [article]. You just need dot points [and] keywords. (p. 9)

Fathers stipulated that a program for expectant fathers should have an attractive layout and be appealing (Da Costa et al., 2017; Hinckley et al., 2007). System quality of *Partners to Parents* was rated positively in relation to the personalisation of the website (Pilkington et al., 2017). Specific feedback on the system quality of the online intervention that was positive included that "*the categories at the top all seem to make sense and are sort of in an order*

that makes sense” and “the pictures are good. The colours are good”, whilst negative comments included: “I think the only thing you’ve got to watch is that some people as soon as they have to fill in a form, even if it’s two name...” and “it’s a little light on, as far as imagery is concerned” (p. 49). Other negative comments regarded navigability and layout.

Tone

Light-Hearted

The tone of support ‘apps’ was generally well received when it was educational (Lee & Walsh, 2015; Shorey, Yang, et al., 2018) had an element of humour (Lee & Walsh, 2015; White et al., 2016) and was non-pedantic.

For me light-hearted would be better. Even the best baby I think that first period is probably strap in and get through it kind of time. So if I have to read a textbook of really ... dry text I’m probably not going to do it... (p. 9)

This was also confirmed by healthcare professionals (White et al., 2016):

[Keep the tone] light-hearted and informative, because otherwise you’ll lose them, and they won’t come back if they’re finding it too heavy and judgmental. (p. 9)

Parents who received advice from midwives in the mHealth ‘app’ *Home-but not Alone* (Shorey, Yang, et al., 2018) found it reassuring for its reliability and promptness. Participants considered the ‘app’ like a “friend” (p. 6):

I think the best part about it is the personal touch ... from the midwife herself. When you ask questions, and know that the midwife will always reply with a “you’re doing good mummy keep it up!” [laughs] Yeah, so I think it is encouraging ... even though it is not me who sent the question. But when you read [it] ... you know? That’s nice.

One father (Rominov et al., 2018) discussed how the use of an external motive for seeking support could make help-seeking more “acceptable” for fathers and reduce the impact of the stigma associated with mental health:

...reframing the whole thing as, by getting help for yourself is a way of helping your baby might be a good way of going about it. (Rominov et al., 2018, p. 463)

Study Authors' Recommendations for Support Services

Support service developers:

- Should consider adopting a “*hybrid*” approach in facilitating fathers to develop their caregiving skills and participating in behavioural parenting training – utilising online / technological support (i.e., forums) as complimentary to formal support (i.e., a provider) (Eriksson & Salzman-Erikson, 2013; Self-Brown et al., 2015)
- Include opportunities for self-reflection and to understand fatherhood in a gendered and generational context (Eriksson & Salzman-Erikson, 2013).
- Individualise and orientate postnatal care for the whole family (Johansson et al., 2013).
- Should aim to include both parents in any intervention, particularly if a crying problem has been identified – considering that a mothers' confidence in fathers' parenting skills was found to be directly related to the amount the father was involved with his infant (Katch, 2012).
- Should develop online support services for fathers that adopt an anonymous design, and promote willingness in fathers to share sensitive information, (e.g., on topics such as infant crying and postpartum depression) (Katch, 2012; Letourneau et al., 2012).
- Should utilise smartphone ‘apps’ to deliver tailored parenting information and offer virtual spaces, as a means of making psychosocial interventions more engaging, more efficient, and less expensive, and to reach clients who might otherwise not be served by traditional parenting programs and services (Grant et al., 2001; Lee & Walsh, 2015; StGeorge & Fletcher, 2011).
- Need to create services that are flexible and cater for fathers' preferences (i.e., offered in person, by phone, or via the Internet) (Letoumeau et al., 2012).
- Should incorporate interactive tools in e-health to encourage fathers to re-engage with the content and not consider it only a “onetime read” (Mackert et al., 2017, p. 723).
- Should not portray fathers as unwise and uninterested (Sioma-Markowska et al., 2016).
- Could include tips in websites for parents to recognise the importance of their social networks as a source of support - given that social support is well-established as a protective factor against perinatal distress (Pilkington et al., 2017).
- Could incorporate videos to demonstrate strategies for communicating effectively or problem-solving as a team, and reach parents with low literacy (Pilkington et al., 2017)
- Consider the use of mobile phone-based text-messaging and mood-tracking programs to assist the transition to fatherhood for young Aboriginal fathers.

Study Authors' Recommendations for Future Research

Future researchers should generally:

- Aim to clarify the efficacy of different formats of delivery of educational interventions for fathers (e.g., web-based / face-to-face / self-modelled video with feedback etc.), as well as fathers' preferences for receiving support individually or as a couple (Benzies & Magill-Evans, 2015).
- Should not avoid asking explicit questions that might otherwise be considered 'taboo' or too sensitive in nature (Katch, 2012), considering the willingness of fathers across these studies to share personal information.
- Further examine the effects of increased researcher interaction in discussion forums (White et al., 2018).

Specific avenues / topics for future research suggested include:

- The perspective and experience of the father in relationship to sleep-deprivation during early infancy (Katch, 2012).
- The relationship between fathering, infant crying and self-consciousness (Katch, 2012).
- Videotaping fathers caring for an inconsolable infant to provide insight into the behaviour and coping strategies of fathers (Katch, 2012).
- The experiences and needs of first-time versus experienced fathers (Shorey, Dennis, et al., 2017).
- Explore the views of midwives / health care professionals regarding the feasibility or acceptability of support programs in their professional practice, not just the parents' perspective (Shorey, Yang, et al., 2018).

Study Authors' Recommendations for Methodological Improvement

Future researchers should:

- Consider ways to overcome the difficulties of getting feedback from participants, such as questionnaires built into the app (Danbjørg et al., 2015).
- Consider leveraging a close connection to community collaborators to assist in circulating the study to potential participants – as opposed to relying on traditional methods of recruitment that may not be as effective (i.e., flyers and bulletin board postings) (Lee & Walsh, 2015).
- Build on traditional educational experience (e.g., face-to-face family-life education) to develop web-based fathering programs (Grant et al., 2001).
- Develop a quantitative measure of coping related to infant crying (Katch, 2012).
- Aim to conduct randomized controlled trials to test the efficacy of various interventions, such as videoconferencing as support in early discharge post childbirth (Lindberg et al., 2009) and online interventions to enhance partner support and reduce anxiety and depression (Pilkington et al., 2017).
- Future samples should randomly select samples of ethnically and economically diverse populations in order to characterize all expectant fathers' health behaviours (Everett et al., 2006; Mackert et al., 2017).
- Aim to conduct longitudinal cohort studies in order to examine fathers' involvement and transition to fatherhood (Shorey, Dennis, et al., 2017). Extend randomized controlled trials to include a follow-up measure (Shorey, Lau, et al., 2017).
- Observe men engaging the features of the app in a real setting, such as the conversation and the leader board, in order to assist with refinements of prototypes (White et al., 2016).

Discussion

The following section discusses the findings and recommendations from the 2 sections, and the subsections within these, that are presented above.

Section 1

The **main findings** were that participants were satisfied, programs were well received, and improved interactions / communication / and engagement with infants were seen (Table 2). Programs were viewed as a good resource and a valuable learning tool, with the 'apps' viewed as a "*lifeline*", "*virtual companion*" and "*source of pride*". Generally, participants found the online tools easy to navigate, useful, and liked the tailored aspects (e.g., being able to track the development of their baby). However, it seems that the most useful part of programs, whatever the platform, seemed to be the interaction / discussion with others. On the negative side, participants had poor engagement and poor attendance at a parent training class, and video-conferencing had mixed results with some participants liking the ease it offered while others found it superficial. Participants also noted that at times they felt disconnected to programs as they were not as informative or interactive as needed to be.

The **study authors recommended** that programs need to be developed, translated to multiple languages and prepare fathers for fatherhood while also offering long-term support to those who require it. The type of support needed by fathers changed over time, so the content of programs needs to be tailored while also making it more interesting and appropriate to 'men'. With this in mind, it was recommended that the empowerment offered by, or conversely the disempowerment due to, telemedicine needs to be explored to ensure men engage. Recruitment of fathers was suggested to be increased by enlisting the help of partners rather than traditional methods (e.g., like flyers and / or print media), and taking advantage of connections in their community. Moreover, different feedback methods need to be incorporated outside of the traditional (e.g., paper and pencil) to explore the effectiveness of programs. Finally, consistent with only one randomized controlled trial (RCT) being identified in the search, the study authors recommended that more RCT's are needed.

The **six reviews** that emerged from the study search included a realist synthesis, a narrative synthesis and three general systematic reviews. All of the reviews focused on interventions applied during the perinatal period. The focus of the interventions ranged from social connectivity, to Internet-based peer support, partner-inclusive interventions preventing postnatal depression and anxiety, co-parenting interventions on paternal co-parenting behaviour and informational interventions on paternal outcomes. An additional "review"

incorporated into this section was a commentary on how fathers are represented in pregnancy ‘apps’, utilising critical discourse analysis of ‘app’ descriptions. Across the reviews, there was a lack of father-oriented programs focusing on paternal outcomes solely. In the relevant studies, social or peer support was identified as important for fathers during the transition to parenthood – both as a preventative measure targeting perinatal mood disorders, and as a factor having further impact on the family unit. There was also a common sentiment that fathers felt confused about their role in the family, particularly in relation to being the “*modern father*” – who must be supportive and involved, yet simultaneously embody the “*inept*” or “*secondary*” figure. Recruitment and attrition were issues across all the reviews, both signified by the sheer lack of father-oriented programs and that follow-up research was difficult with male drop-out. The reviews demonstrated tentative support for interventions or activities involving the co-parent or whole family unit, as well as those of an online nature. In terms of the efficacy of interventions, the findings were predominately inconclusive – largely due to mixed study design and low quality of evidence.

The majority of the reviews included noted that more experimental designs, of a rigorous nature, are needed in future research to determine the efficacy of interventions. Longer follow-up periods was also a commonly cited recommendation for future research, as a necessary means of being able to determine the longitudinal effect of an intervention on parents over the course of the transition to parenthood and against various behavioural outcome measures, such as self-efficacy, depression and anxiety (factors known to take longer to develop). In order to assess the efficacy of an intervention accurately, one review made the recommendation that future studies should attempt to have minimum bias in their research. One review stated that prevention efforts may be more effective if they facilitate both partner and social support together, rather than just one aspect on its own. Study authors stated that social and peer connectivity / support should be valued as a primary goal of any intervention for parents; fathers should be encouraged to participate in peer-support groups, given the significant of the father’s role, for example, in influencing infant-feeding behaviours. This has implications for nurses working with families in the way they approach and include fathers. Lastly, the use of online interventions over traditional antenatal classes may improve the uptake of programs and reduce the burden on healthcare professionals.

Section 2

Fathers’ **experiences of fatherhood** could be interpreted in three main ways – that fatherhood was a positive experience, but a time of uncertainty and challenge. While fathers described their experience of fatherhood as joyous, and “*the best job in the world*”, they did report that the experience was overwhelming, “*a big learning experience*” and “*a roller*

coaster ride". Fathers reported many fears and concerns, particularly in regards to infant and co-parent care, as well as apprehension about their up-coming role. Fathers reported initially feeling "*disconnected*" to their infants, which often fed into feelings of self-consciousness when concerned that they weren't bonding with their infant, or able to calm them. Fathers experienced challenges in many areas, including striking a balance between work and home-life, and feeling overwhelmed with these obligations. Coming to terms with a change in role (i.e., from "*breadwinner*" to "*nurturer*"), with the position in the family (i.e., not as important), and feeling out of their depth with these changes, was another commonly cited challenge of fatherhood. This often led to a sense of both *society* and *family identify conflict*. Fathers reported that they felt physically exhausted by the experience of being a new father and were unprepared for the extreme sleep deprivation and fatigue of caring for an infant.

Barriers to fathers' engagement with support varied considerably across the reviewed studies. The predominant barrier to help-seeking was a general lack of awareness across fathers of available services, followed by experiencing difficulty when attempting to find or access resources. Multiple fathers noted that if they could not find a resource via popular search engines such as Google, they would not know about it or use it. Fathers reported feeling there was "*not a lot of information or any real education*", a "*lack of adequate information available to guide them*" and felt generally "*left-out*" during the perinatal period. This sentiment was found to have manifested in both a formal setting - by healthcare professionals such as nurses, midwives, lactation consultants, and general practitioners – and in an informal setting (i.e., by family or one's co-parent). Support in the form of antenatal education, pamphlets and experiences with doctors and nurses were often noted by fathers as being "*stereotypically focused on mothers...*" and not "*keyed towards [them] as a dad*". In the informal setting, fathers reported "*copping a lot of flak*" if they chose to be a stay-at-home-dad. Additionally, fathers often felt healthcare professionals approached them in a "*belittling*" or "*demeaning*" way. Another deterrent from help-seeking was the stigma associated with it, which many fathers expressed experiences of. Fathers often characterised themselves as "*blokes*" and "*manly*", who "*don't ask questions*"; avoiding external support was perceived as a "*guy thing*" and the topic of mental illness was still very much "*kept in the closet*". The possible influence of stigma on fathers was heightened in a population of Chinese fathers adhering to traditional cultural confinement rituals, as well as a sample of rural, low-income fathers who experienced difficulty "*open[ing] up*" to "*blokes*" they worked or "*played footy*" with. A fear of being judged also emerged as a primary theme / barrier to help-seeking among fathers, and as a result, platforms such as social media, large antenatal classes, or breastfeeding in public were avoided. Lack of time / availability concerns were significant barriers for fathers' involvement in support interventions – a finding

supported by health practitioners who noted that work commitments and *“not having time”* were the most commonly cited barriers.

Fathers **sourced support**, advice and comfort from a diverse pool, ranging from their co-parent, to friends, family, their community, themselves or other resources such as formal organisations, and informal online blogs / social media. Fathers consistently rated healthcare professionals, such as their local general practitioner or midwife, as their most common source of support accessed. In an informal setting, fathers often reported that *“talking with [their] wife”* / co-parent was the greatest substance of their interpersonal needs and strongest source of support. Fathers acknowledged that they acquired a substantial amount of information from their wives who *“looked up a lot”* and *“spoon-fed”* them information. Friends' experiences were valued as a point of comparison to fathers, particularly in regards to negotiating expectations versus actual outcomes for infant-feeding. Friends were viewed as a *“good source of support”* for *“shar[ing] experiences”* and gaining *“reassurance”*. Interestingly, fathers were found to turn to these sources more when they felt excluded by healthcare professionals or their co-parent, but men under great stress reported being less satisfied with other people's support. The family was also identified as an important source of support, particularly as a method of stress reduction, and more commonly for first-time fathers; the involvement of family and elders was reported as being valued highly in Aboriginal and Chinese culture. Despite this, numerous fathers noted an aversion from using their own fathers as a role model of fatherhood, and were *“worried about being a terrible father like [theirs]”*. These fathers felt this may be the result of *“changing expectations”* in a *“greater world”* and suggested that *“more is expected of fathers these days”* with *“increased roles”*. Peer networks, such as church, acted as a strong influencer on infant-feeding practices, as was those found in the workplace and the general community. Public perception of breastfeeding was perceived as commonly negative, but also variant depending on place and context. Fathers also tended to heavily rely on themselves for seeking out or *“digging”* for information, stating that they were often *“winging it”* or using *“common sense”* to answer questions in a *“reactive manner”* when there was an actual need to solve a problem. Informal sources such as Google, WebMD, YouTube, social media, online blogs and other web-sites from the Internet comprised the most common sources of support accessed by fathers. Accessibility, connecting with online friends, accessing social support, sharing information, comparing parenting skills, documenting and archiving fatherhood, learning how to be a father, acquiring ideas for activities with their children and needing to *“unload”* or get something *“off [one's] chest”*, were all reasons that fathers gave for their preference for such sources.

The literature highlighted that fathers have a multitude of **support needs** – the most vital of these being that fathers want and need information that is tailored to their role specifically. Fathers expressed a desire to be a “*better father*” and stated their need for resources that facilitate confidence in their own decision-making for infant care. The timing and duration of support was an additional need identified by fathers, and varied among participants in different contexts. A need for support ranged from first finding out one’s partner was pregnant, to the labour phase and immediate post-birth, to several months postpartum – when fathers reported that things tend to “*settle down*” but are “*still quite tough*”, coupled with fathers having to balance going back to work. Another important support need identified was access to credible and reliable sources of information. Fathers reported feeling “*overwhelmed*” with the sheer magnitude of information available on the Internet, and not knowing which sources “*to go to*” and which ones were “*reputable*”. Fathers reported requiring additional information on a number of topics, for the welfare of their new infant, themselves and their partner. In relation to their infant, fathers reported needing further “*insight*” into experiences as a first-time father, more realistic “*real life scenarios*” as demonstration in antenatal education, and practical advice regarding sleep, food, weight, social and physical development, as well that for soothing, consoling and bonding with their infant. Fathers also reported a need for adequate preparation for the likelihood of extreme sleep deprivation and the subsequent fatigue / exhaustion, more discussion regarding the potential changes which may occur in the dynamics of the couple and family relationships, and additional information on how to maintain their own mental health. Having accessible support was also valued highly among fathers and represents a strong support need. Friends and virtual spaces, such as online chat rooms and discussion forums, were important to fathers who accessed these support networks as an opportunity to “*vent*” and to gain validation or affirmation that they were a “*good dad*”. Fathers expressed a need for “*recognition*” and for perinatal resources to be more “*inclusive*” of them. Fathers reported needing additional support in unique situations, such as severe morning sickness, problems with breastfeeding, problems occurring during childbirth / a surgical birth, not connecting to / bonding with their baby straight away and experiencing or supporting a partner with postpartum depression (PPD). Finally, a supportive and flexible workplace was another area which was identified by fathers as being very helpful during their transition to fatherhood.

Fathers had a considerable number of **recommendations** and **preferences for effective support** interventions, services and information portals, and these related to mode, delivery, content, features / functions, navigability and tone. The various **modes of support** included focus groups with fathers and / or experienced professionals and dads’ groups held in-person, support that was either delivered individually versus in a group setting, and web-

based support versus that provided by mobile-phone applications ('apps'). Fathers varied considerably in their preference for these. Support groups run by or including experienced fathers were highly recommended for their "*hands-on approach*" and their ability to foster "*share[d] experiences*", answer "*frequently asked questions*" and couple first-time fathers with "*mentors*". Many fathers expressed their preference for their facilitator of support to have a combination of both personal and professional experience. Fathers recommended 'Dads groups' such as weekend walks around the city, where fathers could incorporate exercise, bonding with their child and "*getting in some bloke time*", all in one. Fathers affected by PPD and receiving one-on-one support particularly favoured meetings in the home environment over a community centre. Large classes were noted as being a potential source of reluctance, for not being "*intimate*". Internet and mobile-health applications, whilst not always a preference, were perceived as suitable methods for their convenience, ability to recap content, and opportunity for users to connect with healthcare professionals and other fathers via interactive components. Other types of modes of support discussed included videoconferencing, interactive talk shows, and telephone support. Face-to-face support was rated highly for the "*great personal connection*" that it offered over other modes. This preference was closely followed by telephone support. Some fathers favoured an intervention program that incorporated all three modes of face-to-face, telephone and online.

Fathers expressed preferences for the **delivery** of interventions / support in relation to its location, the facilitator, timing and duration. Home visits were deemed "*very convenient*", however fathers who experienced videoconferencing (VC) assumed that meeting the midwife via a VC session would be less of a threat to their privacy than having the midwife visit their home. Furthermore, the home environment provided "*peace and quiet*" and interventions delivered here were seen as a "*lifeline*" or "*friend*". However, fathers receiving group support stated they would prefer to receive it in a community setting. In terms of preferences for the facilitator or provider of support, fathers had varying opinions – some supported the notion of having peers as their mentors, whilst some wanted a professional facilitator, and others thought a combination of the two would be ideal. Fathers' recommendations for timing of support varied considerably – the take-home message is that fathers are expressing the need for additional support across the perinatal period, from the early stages of finding out about pregnancy, leading up to childbirth, and one year postpartum. Some fathers thoughts that 4 months was the right time to start a program – others felt that 2 weeks post-delivery would be a good point. In cases of PPD, fathers were split in their recommendations for the most suitable timing of an intervention – some felt that treatment should begin as soon as symptoms became apparent, whereas others felt that this should commence one week to several months after childbirth. Interventions post-delivery

were generally perceived very positively for providing a sense of control, support and reassurance and specifically reducing “worry” that can occur between doctor’s follow-up sessions. Continuous information was seen as an “*advantage*” and “*ingenious*” to facilitate this. Fathers generally recommended that the specific timing of interventions would be most suitable later in the week. Thursdays and Fridays were rated highly as a day to receive information as this allowed for information to be processed leading up the weekend (family time). Later afternoons on weekdays was also preferred in another study. Interventions that were designed to be implemented outside of work hours were favoured. The length or duration of interventions varied also, but this was likely due to the nature of the intervention. An ‘app’-based internet support service was rated favourable if it “*took five minutes...*” and wasn’t a “*time-suck*”, whereas fathers who participated in the *Father-Infant Interaction Program (FIIP)* suggested that the program be extended to a full year of visits to cover important developmental milestones.

An overarching theme of fathers’ preferences for support **content** was that fathers desire useful and relevant information to help build their caregiving skills and confidence in decision-making. ‘App’ content was generally rated favourable if it was “*interesting*”, “*useful*”, “*relevant to parenting experiences*”, and catered to a “*local context*” and “*new generation parents*”. Fathers expressed interest in receiving practical content and tips when accessing web-based support, specifically in developing certain basic childcare skills such as handling their infant, changing nappies, feeding and bathing. Interacting, playing and bonding with their baby were also recommendations from fathers of another study. Topics of interest welcomed by fathers from the *FIIP* were “*guidance for interactions between dad and baby*”, “*reading baby’s body language*”, and “*seeing things that you don’t usually think about*”. Nutrition and financial preparation were other popular topics clicked on by fathers. The least popular topics were breastfeeding and sex after birth, and almost no fathers in one study asked about sleep training. Whilst Aboriginal fathers were particularly interested in the routines of Aboriginal and Torres Strait Island parents and “*baby talk*”, they were not as interested in topics related to infant “*crying*”, “*bonding*” and “*postnatal depression and women*”. Many fathers noted that they felt the content of available resources was often geared towards first-time fathers only, and that they would recommend future support web-sites and ‘apps’ to cater across a broad cross-section of first-time and experienced fathers, as one states: “*...it (the app) turned out to be so helpful even though I already have kids – it reminded me all kids aren’t the same and helped me try new things*”. Fathers who had older children suggested a widening of educational topics in order to address this: “*it might be useful to have some topics of parents that are already parents*”. In terms of the co-parent, fathers frequently searched content on “*childbirth without pain*”, “*healthcare*” and “*caring for*

women after childbirth". Any negative comments regarding content of online interventions were if it was "too academic". Prolonging a father's visit to a website was achieved if fathers felt they had a "desire to improve knowledge" and "experience[d] the website as rewarding". Updating content was stated as one way to engage fathers and increase their chances of revisiting a support website. Another very important recommendation for support service content was that the information be credible and informed by evidence-based research.

In terms of **features and functions**, fathers rated support interventions highly if they were interactive and easy to access. Preferences of interactive components included logging a child's developmental milestones with potential involvement of co-parent, receiving tailored parenting education, the inclusion of audio and video features, push notifications and a discussion forum. However, "notification fatigue" and lack of trustworthiness, were concerns of the latter two components, respectively. Others felt that the forum allowed for fathers to connect with other parents, to put things into perspective and provide a crucial link to the "outside home". The use of graphics, colour and imagery was strongly favoured by fathers cross-culturally, for enabling ease of understanding and encouraging fathers to "engage" in and enjoy the "feel" of an application. These notions were strongly linked with a preference among fathers for increased tailoring of content and features to be "appealing" and "attractive" and relevant to individualised needs, such as a father requiring activity suggestions with both a new child and an older child. Brief messages, delivered in dot point form or checklists, were also rated highly as a feature of a support source: "I get sick of apps that send too much information or send things too often" / "I want bullet points...". A clear, "quick and easy" navigation structure was rated highly by fathers, and if this was lacking, was perceived as a negative aspect of the support source. Being user-friendly and facilitating the recapping and recalling of essential information were important aspects of this. The **tone** of the 'app' was well received if it was educational, informative and non-pedantic, yet light-hearted and humorous.

General Study Authors' Recommendations

Recommendations for **healthcare professionals** pertain to nurses, midwives, lactation consultants, doctors and antenatal caregivers. There was a general consensus across the authors of the reviewed studies that professionals in perinatal care should recognise the great responsibility they have in providing a considerable amount of support to fathers of new children in what is considered a rather narrow window, yet a "teachable moment" and time of "major transition" – where the potential for behaviour change is ripe. Healthcare professionals need to ensure they are adopting an attitude which facilitates fathers to feel "comfortable, welcomed and involved". Encouraging partners to attend perinatal

appointments is crucial, as this is an important opportunity to engage fathers and include them in pregnancy. This is also a valuable opportunity to normalise highly stigmatising mental health issues, such as experiences of PPD, and to provide information and a treatment plan for its possibility. Considering that fathers have a strong preference to seek information from their general practitioner or nurse / midwife during the perinatal period, health care professionals may see this timeframe as a “*window of opportunity*” to pass on their preferred and credible websites or support services for use. This may assist to overcome the consequences of fathers who have a tendency to “*dig for information*” on their own and feel “*overwhelmed*” or unable to trust the source. Furthermore, practitioners should take advantage of the ease of sharing hyperlinked information on platforms such as Facebook, and be constantly monitoring forums and blogs to ensure that reputable information and guidance are circulated for online users.

Study authors also had recommendations for **general healthcare / policy**, in regards to the implementation of educational programs targeted specifically at fathers. These programs need to encourage paternal prenatal education and involvement in the delivery room of first-time fathers in particular, and countries which do not support this notion are recommended by these authors as needing to “*reconsider how they organise their services*”. Screening for postpartum depression and mood disorders was recommended not only for mothers but for fathers too, particularly if a co-parent is depressed. Baby-friendly communities are needed to facilitate social support, particularly for stay-at-home-dads. Perinatal services and resources need to ensure that they are adequately promoting themselves and reaching fathers of new children – particularly given the tendency of fathers to “*wing it*” and only seek information in a reactive manner, coupled with their need and desire to be more “*included*” in and have access to support services. Services designed to be implemented outside of business hours or via telephone / online methods have the potential to reach more fathers and overcome barriers to engagement such as stigma, masculinity, fatigue and time restraints. Effectively targeting men with well-designed interventions has the ability to improve not only on paternal outcomes, but those for the mother and child.

The study authors had recommendations for the development and delivery of **support services**. Specifically, services which adopt and incorporate both a formal and informal approach – or as one author describes, a “*hybrid*” approach – may be most beneficial. Combining the use of technology with a provider may be a feasible way to engage fathers in behavioural parenting training; virtual spaces such as online discussion forums may be an appropriate meeting place for fathers to gain social support, on top of antenatal education groups. Adapting postnatal care to incorporate elements of self-reflection and to be sensitive

to gendered and generational context, may be a means of supplementing what fathers tend to seek out from informal sources (i.e., the Internet). Given the important role that a co-parent plays in providing support, information, and creating a sense of wellbeing and confidence in fathers, it was recommended that both parents be included in any parenting intervention. However, attention must be paid to ensure that fathers are not portrayed as only engaging in pregnancy with the involvement of their partner, to avoid contributing to and reproducing social stereotypes. Overall, support for fathers needs to be individualised, yet oriented towards the whole family. Online services and information delivered by smartphone 'apps' and e-health platforms have been recommended by numerous authors of the included studies for various reasons – some of these include: the anonymity of online platforms may encourage candidness of responses and more willingness in fathers to share sensitive information and seek help, the information can be tailored to individualised needs, fathers may find these services more engaging, they are less expensive and may reach clients who might not otherwise be able to access such services. The interactive elements which these platforms may provide, such as demonstration videos, push notifications, embedded discussion forums, financial and nutrition planners and virtual tracking of developmental milestones, may help to more effectively engage fathers, as well as improving accessibility for parents with low literacy. However, telephone support may be an effective means of providing the one-on-one support that some fathers desire and do not feel they receive from Internet interventions. In addition, there is potential for online support methods, particularly social media, to add to parents' stress, rather than alleviate it. The take-home message is that support interventions need to be flexible and open to tailoring – with the option to be delivered in person, by phone or via the internet.

Recommendations for **content of interventions** include a need to address the support needs of fathers, particularly any areas in which fathers tend to lack in knowledge. Some of these key topics include comprehensive postpartum depression criteria for detection in partner and self, maintenance of one's own mental health, perceptions of infant crying, financial and nutritional preparation, preparation for sleep-deprivation and fatigue as well as practical tips and advice on caring for / handling / playing with infant. Specifically, in order to deal with the stress of infant crying, fathers need to have a basic understanding of how infants can be intentional in behaviour, how to interpret this, and build confidence in caregiving skills. Intervention content might also address known risk factors for new fathers, such as an increase in smoking, drinking and consumption of unhealthy food. Intervention content may also address known protective factors for new fathers in preventing perinatal distress, such as encouraging the involvement of the co-parent (demonstrated to facilitate involvement and improve confidence) and include tips on accessing and embracing social

support. Whilst the following recommendation was made as a suggestion for dealing with a partner suffering from PPD, education that is generally organised in the following way may be an appropriate approach for dealing with any problems / concerns in the perinatal period between father and co-parent: (a) what to look for (i.e., symptoms); (b) how to empathically initiate discussion; and (c) how to facilitate self-care and formal treatment for partner. A major recommendation for intervention content is that it is evidence-based, light-hearted in tone, conversational-driven and humorous, without depicting fathers as “*deficient*” in their knowledge or “*uninterested*” and thereby further contributing to social norms and expectations.

Recommendations for **future research** mainly revolved around testing interventions and assessing outcomes in ethnically and economically diverse populations, such as urban versus remote communities, and in various cultures. Considering the diverse array of response in relation to experiences of support, sources of support, support needs and preferences for support among fathers, further studies are needed to determine whether clarification can be determined. For example, this could pertain to the format of delivery (i.e., web-based, face-to-face, individual / group etc.), whether the results differ for first-time versus experienced fathers, and whether the results differ for fathers with pre- versus late-term infants. Future studies may also benefit from assessing how healthcare professionals regard the feasibility and acceptability of programs (i.e., *SMS4Dads*, *Home-but-not Alone*, *Partners to Parents*, *MilkMan* etc.) in their professional practice.

Study authors’ recommendations for **methodological improvements** to future research largely base around the study design chosen for testing the efficacy of support interventions for fathers of new children. The majority of studies assessing the feasibility, usability, acceptability or efficacy of an intervention for fathers noted that – if not already used – a randomized controlled trial would be essential to any further consideration of an intervention. Longitudinal studies were also a major recommendation, in order to assess fathers over the entire perinatal period / transition to fatherhood (which may even require follow-up with fathers of children transitioning to teenagers). Observational designs were also commonly suggested, as observing men engage with features of an intervention (i.e., an ‘app’) in a real-life setting could assist in refinements of the prototype. To overcome what appears to be a common difficulty in research with fathers (i.e., small samples) researchers may need to approach recruitment in a different way, for example, by (a) including questionnaires built into ‘apps’; or (b) leveraging connections with community collaborators as opposed to solely relying on traditional methods, such as flyers and bulletin posters.

SUMMARY OF DISCUSSION

EFFECTIVENESS OF INTERVENTIONS

- The review indicated tentative support for interventions targeting the mental health of new fathers. Overall, new fathers viewed interventions as a “*vital*” support (particularly the interactive elements), but also felt “*inept*” as fathers and like a secondary figure to mothers. The effectiveness, or ineffectiveness, of interventions was unclear as studies lacked the methodological rigour to determine this and generally tested only the usability of and satisfaction with programs.

FATHERS’ EXPERIENCES OF FATHERHOOD

- Fathers reported the experience of fatherhood as “*joyous*”, but also an uncertain “*roller-coaster-ride*” amidst an overload of information and expectations. Fathers felt initially “*disconnected*” to their child and self-conscious about how their fathering abilities may be perceived by others (good vs. bad dad). Furthermore, fathers reported feeling challenged by the multiple roles they now held (supportive father vs. breadwinner vs. husband etc.), the shifting position of importance in the family, and the overwhelming exhaustion that comes with caring for an infant.

FATHERS’ EXPERIENCES OF SUPPORT

- Fathers reported common barriers to accessing support included not knowing what type of, and where, support was available. Fathers felt “*left-out*” of or “*belittled*” by the support that was offered by health care professionals, along with a stigma, lack of privacy, and inaccessibility associated with support that in turn discouraged help-seeking.
- Common sources of support reported by fathers included their co-parent, friends, family, community, themselves, and other resources such as online support, nurses, midwives, social media, and online blogs. Fathers reported they needed credible / practical / specific supports for care giving needs (e.g., breastfeeding, postpartum depression) that are tailored to a father’s role and accessible when it’s needed, along with flexible employment conditions to take advantage of these.

FATHERS’ RECOMMENDATIONS FOR EFFECTIVE SUPPORT

- Fathers reported variation in terms of preference for support (e.g., individual, group, online). More importantly, for support to be effective it was recommended it needed to be tailored, credible, interactive, engaging, useful (relevant), on-going, light-hearted, and accessible when needed (i.e., developmental stage).

SUMMARY OF STUDY AUTHORS' RECOMMENDATIONS

FOR THE ATTITUDES / BEHAVIOURS / ACTIONS OF HEALTHCARE PROFESSIONALS

- Pregnancy should be viewed as a teachable moment with fathers made to feel comfortable and involved in parenting programs, particularly with the family doctor. Moreover, a focus needs to be placed on co-parenting (e.g., feeding practices, infant crying, and attending appointments) and the involvement of fathers.

FOR HEALTHCARE AND POLICY IMPLICATIONS

- Men may be more open to, aware of, interested in, and receptive to information designed to promote theirs and their family's wellbeing. Healthcare professionals need to promote the availability of resources and supports to engage the willing but potentially reluctant fathers to receive and informally share intimate or stigmatising information.

FOR SUPPORT SERVICES

- Hybrid 24/7 approaches (face-to-face and online) monitored by midwives and incorporating the use of mentors should be considered. Approaches should involve co-parents, be orientated to the whole family, offer opportunities to contribute (anonymously if wanted), be tailored to fathers preferences (e.g., platform), contain interactive content, portrays fathers as 'fathers' rather than unwise / uninterested stereotypes, and encourage social connection with others.

FOR SUPPORT SERVICE CONTENT

- Content should be evidence-based, adopt a conversational tone, and focus on specific symptoms (e.g., postpartum depression) and how to talk about these with and facilitate self-care and formal treatment for their co-parent (build confidence in skills).

FOR FUTURE RESEARCH

- Need to clarify the efficacy of different types of support for fathers, the difference between full-term and pre-term parents' level of skill and confidence, the experience of fathers in relation to specific issues (e.g., infant crying, first time vs. experienced), and the potential of empowerment-disempowerment by telemedicine / mobile 'apps'.

FOR METHODOLOGICAL IMPROVEMENTS

- Randomized controlled and longitudinal trials need to be conducted to examine fathers' transition to fatherhood. Research should consider new alternatives for recruiting (e.g., community connections) and obtaining feedback from fathers (e.g., inbuilt into 'app'), as well as developing quantitative measures related to infant crying.

CONCLUSION

In line with the objectives of the South Australian Mental Health Commission (SAMHC), the current report set out to build an evidence-base to inform resources and services aimed at supporting the mental health and wellbeing needs of 'new' fathers. A systematic search of the literature identified 68 studies. A narrative synthesis was undertaken to 'tell the story' of the combined findings. Taken together, the findings from these studies suggested that the perinatal period is a "*teachable moment*" for fathers and the community. Fathers require and want support that is timely, tailored, and accessible, while general practitioners, nurses, co-parents, and support interventions (i.e., the community) must realign their focus to provide support that is inclusive, credible, and practical. Fathers indicated that, in terms of *formal* support, nurses and general practitioners are a common and trusted source, but in terms of *informal* support, social media, blogs, and mobile 'apps' are preferred. Regardless of the type of information (e.g., formal or informal), its timing or the platform used, fathers indicated that the most essential elements of support services were inclusiveness, relevance, and social connection. Fathers indicated that they required inclusive support that provided a testing ground for ideas, a way to prepare for the role of a father with useful, relevant, and credible information, and a chance to seek support or ask questions from professionals or experienced fathers in a safe non-judgmental space (live or virtual) that didn't make them feel like only a "*shadow in the room*".

While there are numerous essential take-home messages highlighted in the report, arguably the indication that 'new' fathers reported feeling "*excluded*", "*inept*", and "*secondary*", and that the study designs were mixed, are important to note in terms of promoting and understanding the mental health and wellbeing needs of fathers. Becoming a "*good father*" does not always come naturally and may take time to achieve for some, but what it is apparent is that the perinatal period is a "*teachable moment*" that is not fully harnessed to support the mental health and wellbeing needs of new fathers, and which may also reflect a missed opportunity to support the needs of their partners and children. As evidenced by the research trajectory to date, while findings from pilot studies are common, those from larger-scale / longitudinal trials to investigate efficacy and effectiveness of interventions are rare, and measures used inconsistent. It is hoped that the current report provides a guide to assist researchers when developing future studies and support services, and a platform for the community to fully utilise this "*teachable moment*", assist to engage fathers and facilitate their confidence to be a "*supportive and involved*" figure in the family unit.

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Appendix A.
Search Strategy

Database(s): Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) 1946 to August 31, 2018

#	Searches	Results
1	Mental Health/	31653
2	Resilience, Psychological/	3988
3	happiness/ or hope/ or laughter/ or love/ or pleasure/	10237
4	self concept/ or self efficacy/	69696
5	(wellness or wellbeing or well-being or positive psych* or resilien* or flourish* or languish* or optimis* or eudamonic or hedonic or resilien* or positivism* or happy or happiness or pleasur* or positive emotion* or life satisfaction or self accept* or personal growth or positive relations* or psychological endurance or mental endurance or enthusias* or gratitude or grateful* or pride or self efficacy or parental satisfaction).tw,kf.	227870
6	(healthy adj2 (behavio\$r or attitude or outlook)).tw,kf.	1072
7	(Mental health* or resilien* or anxiety* or anxious or stress* or panic disorder* or social phobia*).tw,kf.	991327
8	*ANXIETY/	36612
9	*STRESS, PSYCHOLOGICAL/	67547
10	*Panic Disorder/	5035
11	*Phobia, Social/	348
12	or/1-11	1239898
13	Fathers/	8032
14	Parents/ and (Postpartum Period/ or Infant, Newborn/)	7209
15	(father* or dad* or stepfather* or puppa*).tw,kf.	50908
16	new parent*.tw,kf.	912
17	or/13-16	61008
18	Mobile applications/ or *Webcasts as topic/ or *social networking/ or *smartphone/ or *text messaging/ or video games/	11530
19	(webcast* or podcast* or mobile application* or smartphone* or iphone or android or text messag* or app or apps or virtual reality or ipad* or tablet comput* or tablet device* or instant messag* or SMS* or whatsapp or Youtube* or video gam*).tw,kf.	50855
20	*Telemedicine/ or *telenursing/ or *telepsychiatry/ or *remote consultation/ or *remote sensing technology/ or *videoconferencing/	19964
21	(e-health* or ehealth* or electronic health* or e-technolog* or etechnolog* or digital health* or digital technolog* or mobile health* or mhealth* or m-health* or e-learning* or elearning* or e-medicine* or emedicine* or e-therap* or etherap* or health information technolog* or e-support*).tw,kf.	27466
22	(Telemedicine or telehealth* or telecare* or telemonitor* or remote consult* or remote monitor* or televideo* or teleconsult* or e-consult* or econsult* or telemedical* or telepsychiatr* or remote sensing technolog* or virtual hospital* or teleconferenc* or video conferen* or videoconferenc* or telediagnos* or telenursing).tw,kf.	18999

23	(*Telecommunications/ or *Computers/ or *computers, handheld/ or *microcomputers/ or "User-computer interface"/ or *Internet/) and (Patient education as topic/ or Learning/ or Health education/ or Self care/ or Self help groups/ or *Teaching materials/ or *Health knowledge, attitudes, practice/ or *communication/ or *counseling/ or *consumer health information/ or *Therapy, computer assisted/ or *health services accessibility/ or *delivery of health care/)	10547
24	((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) adj5 (support or self help or chat or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*).tw,kf.	101670
25	or/18-24	195305
26	17 and 25	518
27	("28276086" or "27349756").ui.	2
28	(Theory-Based Design and Development of a Socially Connected Gamified Mobile App for Men About Breastfeeding).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1
29	(A randomized controlled trial to examine the effectiveness of the Home but not Alone mobile health application educational program on parental outcomes).m_titl.	1
30	28 or 29	2
31	26 and 30	2

Database(s): PsycINFO 1806 to September Week 1 2018. Search Strategy:

#	Searches	Results
1	Mental Health/	57959
2	Resilience, Psychological/	11801
3	happiness/ or hope/ or laughter/ or love/ or pleasure/	20767
4	self concept/ or self efficacy/	61979
5	Empathy/	12155
6	optimism/ or positive emotions/	5071
7	exp Well Being/	38393
8	(healthy adj2 (behavio\$r or attitude or outlook)).ti,ab,id.	947
9	mental health services/ or community mental health services/ or community mental health centers/ or community services/ or mental health programs/	60596
10	(wellness or wellbeing or well being or positive psych* or resilien* or flourish* or languish* or optimis* or eudamonic or hedonic or resilien* or positivism* or protective factor* or happy or happiness or pleasur* or positive emotion* or positive affect* or life satisfaction or self accept* or personal growth or autonomy or positive relations* or psychological endurance or mental	316138

	endurance or affection or enthusias* or gratitude or grateful* or love or pride or sympath* or empath*).ti,ab,id.	
11	(Mental health* or resilien* or anxiety* or anxious or stress* or panic disorder* or social phobia*).ti,ab,id.	549449
12	(community adj2 (mental health* or welfare service*)).ti,ab,id.	11126
13	*anxiety/ or *stress/ or *panic disorder/	85949
14	or/1-13	863496
15	fathers/ or adolescent fathers/ or single fathers/ or expectant fathers/	10323
16	(father* or stepfather* or dad* or puppa*).ti,ab,id.	47488
17	new parent*.ti,ab,id.	677
18	or/15-17	48625
19	social media/ or online social networks/	11047
20	mobile devices/ or cellular phones/ or text messaging/	6273
21	(e-health* or ehealth* or electronic health* or e-technolog* or etechnolog* or digital health* or digital technolog* or mobile health* or mhealth* or m-health* or mobile technolog* or e-learning* or elearning* or e-medicine* or emedicine* or e-prescribing* or eprescribing* or e-therap* or etherap* or health information technolog* or health technolog* or healthcare information technolog* or health care information technolog* or health care IT or healthcare IT or health ICT or "health information and communication technolog*" or e-support*).ti,ab,id.	11484
22	(webcast* or podcast* or mobile application* or social network* or social media* or multimedia* or phone or telephone or cellphone* or smartphone* or iphone or text messag* or texting or app or apps or twitter or facebook* or instagram* or virtual reality or wireless device* or wireless technolog* or ipad* or tablet comput* or tablet device* or instant messag* or SMS* or whatsapp or Youtube* or video gam*).ti,ab,id.	85689
23	*Telemedicine/ or *telenursing/ or telepsychiatry/ or *remote consultation/ or *remote sensing technology/ or *videoconferencing/	3953
24	(Telemedicine or telehealth* or telecare* or telemonitor* or remote consult* or remote monitor* or televideo* or teleconsult* or e-consult* or econsult* or telemedical* or telepsychiatr* or remote sensing technolog* or virtual hospital* or teleconferenc* or video conferen* or videoconferenc* or telediagnos* or smartscop* or assistive technolog* or telenursing).ti,ab,id.	6527
25	((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or video* or DVD* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) adj5 (support or self help or chat or discussion* or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*).ti,ab,id.	88300
26	(*Telecommunications/ or *Computers/ or *computers, handheld/ or *microcomputers/ or "User-computer interface"/ or *Internet/) and (Patient education as topic/ or Learning/ or Health education/ or Self care/ or Self help groups/ or *Teaching materials/ or *Health knowledge, attitudes, practice/ or *communication/ or *counseling/ or *consumer health information/ or *Therapy, computer assisted/ or *health services accessibility/ or *delivery of health care/)	2271

27	or/19-26	174126
28	18 and 27	1176
29	limit 28 to english language	1062

Database(s): Ovid Emcare 1995 to 2018 week 35. Search Strategy:

#	Searches	Results
1	mental health/ or psychological well being/	81558
2	coping behavior/	34372
3	happiness/ or emotion/	38733
4	hope/	10292
5	pleasure/	1603
6	love/	3483
7	laughter/	203
8	self confidence/	47
9	self efficacy/	29799
10	(wellness or wellbeing or well being or positive psych* or resilien* or flourish* or languish* or optimis* or eudamonic or hedonic or resilien * or positivism* or happy or happiness or pleasur* or positive emotion* or life satisfaction or self accept* or personal growth or positive relations* or psychological endurance or mental endurance or enthusias* or gratitude or grateful* or pride or self efficacy or parental satisfaction).tw,kw.	126659
11	(healthy adj2 (behavio\$r or attitude or outlook)).tw,kw.	631
12	(Mental health* or resilien* or anxiety* or anxious or stress* or panic disorder* or social phobia*).tw,kw.	320502
13	anxiety/	64724
14	stress/ or social stress/	22394
15	panic/	5904
16	social phobia/	4989
17	or/1-16	504391
18	father/ or adolescent father/ or expectant father/ or father child relation/	12272
19	(father* or dad* or stepfather* or puppa*).tw,kw.	17229
20	new parent*.tw,kw.	407
21	or/18-20	18322
22	mobile application/ or mobile phone/	8844
23	social network/	11980
24	Internet/ or teleconference/ or webcast/	46460
25	smartphone/	1970
26	text messaging/	1778
27	video game/	789
28	(webcast* or podcast* or mobile application* or smartphone* or iphone or android or text messag* or app or apps or virtual reality or ipad* or tablet comput* or tablet device* or instant messag* or SMS* or whatsapp or Youtube* or video gam*).tw,kw.	21706

29	telemedicine/	8218
30	telenursing/	185
31	telepsychiatry/	353
32	teleconsultation/	3698
33	*videoconferencing/	434
34	(e-health* or ehealth* or electronic health* or e-technolog* or etechnolog* or digital health* or digital technolog* or mobile health* or mhealth* or m-health* or e-learning* or elearning* or e-medicine* or emedicine* or e-therap* or etherap* or health information technolog* or e-support*).tw,kw.	18939
35	(Telemedicine or telehealth* or telecare* or telemonitor* or remote consult* or remote monitor* or televideo* or teleconsult* or e-consult* or econsult* or telemedical* or telepsychiatr* or remote sensing technolog* or virtual hospital* or teleconferenc* or video conferen* or videoconferenc* or telediagnos* or telenursing).tw,kw.	12949
36	(*Telecommunications/ or *Computers/ or *computers, handheld/ or *microcomputers/ or "User-computer interface"/ or *Internet/) and (Patient education as topic/ or Learning/ or Health education/ or Self care/ or Self help groups/ or *Teaching materials/ or *Health knowledge, attitudes, practice/ or *communication/ or *counseling/ or *consumer health information/ or *Therapy, computer assisted/ or *health services accessibility/ or *delivery of health care/)	5220
37	((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) adj5 (support or self help or chat or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*).tw,kw.	57724
38	or/22-37	146563
39	21 and 38	446

#	Query	Limiters/Expanders	Last Run Via	Results
S38	S20 AND S36	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S37	S15 AND S20 AND S36	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	Display

			Search Screen - Advanced Search Database - CINAHL	
S36	S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S35	TI (((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) N4 (support or self help or chat or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*))) OR AB (((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) N4 (support or self help or chat or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

	behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*)))			
S34	TI (((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) adj5 (support or self help or chat or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*))) OR AB (((online or on-line or digital* or electronic or computer* or software or internet* or web or website* or technology-based or interactiv* or telecommunicat* or "information and communication technolog*" or ICT) adj5 (support or self help or chat or communicat* or self care or self manag* or stress management or self efficac* or intervention* or education* or training or learning or teaching or health information* or patient information* or information service* or therap* or lifestyle* or life style* or motivat* or healthcare or health care or complian* or adheren* or monitor* or delivery or behaviour* or behavior* or health promotion* or home health* or home care or counsel* or decision or tool*)))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S33	((MH "*Telecommunications") OR (MH "*Computers") OR (MH "*computers, handheld") OR (MH "*microcomputers") OR (MH "User-computer interface") OR (MH "*Internet")) AND ((MH "Patient education as topic") OR (MH "Learning") OR (MH "Health education") OR (MH "Self care") OR (MH "Self help groups") OR (MH	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

	"*Teaching materials") OR (MH "*Health knowledge, attitudes, practice") OR (MH "*communication") OR (MH "*counseling") OR (MH "*consumer health information") OR (MH "*Therapy, computer assisted") OR (MH "*health services accessibility") OR (MH "*delivery of health care"))			
S32	TI ((Telemedicine or telehealth* or telecare* or telemonitor* or remote consult* or remote monitor* or televideo* or teleconsult* or e-consult* or econsult* or telemedical* or telepsychiatr* or remote sensing technolog* or virtual hospital* or teleconferenc* or video conferen* or videoconferenc* or telediagnos* or telenursing)) OR AB ((Telemedicine or telehealth* or telecare* or telemonitor* or remote consult* or remote monitor* or televideo* or teleconsult* or e-consult* or econsult* or telemedical* or telepsychiatr* or remote sensing technolog* or virtual hospital* or teleconferenc* or video conferen* or videoconferenc* or telediagnos* or telenursing))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S31	TI ((e-health* or ehealth* or electronic health* or e-technolog* or etechnolog* or digital health* or digital technolog* or mobile health* or mhealth* or m-health* or e-learning* or elearning* or e-medicine* or emedicine* or e-therap* or etherap* or health information technolog* or e-support*)) OR AB ((e-health* or ehealth* or electronic health* or e-technolog* or etechnolog* or digital health* or digital technolog* or mobile health* or mhealth* or m-health* or e-learning* or elearning* or e-medicine* or emedicine* or e-therap* or etherap* or health information technolog* or e-support*))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S30	(MH "Videoconferencing")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen -	Display

			Advanced Search Database - CINAHL	
S29	(MH "Remote Consultation")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S28	(MH "Telenursing")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S27	(MH "Telemedicine") OR (MH "Telepsychiatry") OR (MH "Telehealth")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S26	TI ((webcast* or podcast* or mobile application* or smartphone* or iphone or android or text messag* or app or apps or virtual reality or ipad* or tablet comput* or tablet device* or instant messag* or SMS* or whatsapp or Youtube* or video gam*)) AND AB ((webcast* or podcast* or mobile application* or smartphone* or iphone or android or text messag* or app or apps or virtual reality or ipad* or tablet comput* or tablet device* or instant messag* or SMS* or whatsapp or Youtube* or video gam*))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

S25	(MH "Video Games") OR (MM "Games")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S24	(MM "Smartphone") OR (MH "Text Messaging") OR (MH "Electronic Mail") OR (MH "Computers, Hand-Held") OR (MH "Cellular Phone")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S23	(MH "Social Networking")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S22	(MH "Webcasts") OR (MH "World Wide Web Applications")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S21	(MH "Mobile Applications") OR (MH "Multimedia") OR (MH "Web Browsers")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

S20	S16 OR S17 OR S18 OR S19	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S19	TI "new parent*" OR AB "new parent*"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S18	TI ((father* or dad* or stepfather* or puppa*) OR AB ((father* or dad* or stepfather* or puppa*))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S17	(MH "Parents") AND ((MH "Postnatal Period") or (MH "Infant, Newborn"))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S16	(MH "Fathers") OR (MH "Expectant Fathers") OR (MH "Adolescent Fathers")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

S15	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S14	(MM "Panic Disorder")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S13	(MH "Stress")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S12	(MH "Anxiety")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S11	TI ((Mental health* or resilien* or anxiety* or anxious or stress* or panic disorder* or social phobia*)) OR AB ((Mental health* or resilien* or anxiety* or anxious or stress* or panic disorder* or social phobia*))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

S10	TI ((healthy N1 (behavio\$r or attitude or outlook))) OR AB ((healthy N1 (behavio\$r or attitude or outlook)))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S9	TI ((wellness or wellbeing or well being or positive psych* or resilien* or flourish* or languish* or optimis* or eudamonic or hedonic or resilien* or positivism* or happy or happiness or pleasur* or positive emotion* or life satisfaction or self accept* or personal growth or positive relations* or psychological endurance or mental endurance or enthusias* or gratitude or grateful* or pride or self efficacy or parental satisfaction)) OR AB ((wellness or wellbeing or well being or positive psych* or resilien* or flourish* or languish* or optimis* or eudamonic or hedonic or resilien* or positivism* or happy or happiness or pleasur* or positive emotion* or life satisfaction or self accept* or personal growth or positive relations* or psychological endurance or mental endurance or enthusias* or gratitude or grateful* or pride or self efficacy or parental satisfaction))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S8	(MH "Self-Efficacy")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S7	(MH "Self Concept")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced	Display

			Search Database - CINAHL	
S6	(MH "Love")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S5	(MH "Pleasure")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S4	(MH "Hope") OR (MH "Optimism")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S3	(MH "Positive Psychology") OR (MH "Pleasure") OR (MH "Happiness")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S2	(MH "Hardiness")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen -	Display

			Advanced Search Database - CINAHL	
S1	(MH "Mental Health")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

Scopus:

TITLE-ABS-KEY ((father* OR dad* OR stepfather* OR puppa*)) AND TITLE-ABS-KEY (("webcast*" OR "podcast*" OR "mobile application*" OR "smartphone*" OR "iphone" OR "android" OR "text messag*" OR "app" OR "apps" OR "virtual reality" OR "ipad*" OR "tablet comput*" OR "tablet device*" OR "instant messag*" OR "SMS*" OR "whatsapp" OR "Youtube*" OR "video gam*" OR e-health* OR "ehealth*" OR "electronic health*" OR "e-technolog*" OR "etechnolog*" OR "digital health*" OR "digital technolog*" OR "mobile health*" OR "mhealth*" OR "m-health*" OR "e-learning*" OR "elearning*" OR "e-medicine*" OR "emedicine*" OR "e-therap*" OR "etherap*" OR "health information technolog*" OR "e-support*" OR "Telemedicine" OR "telehealth*" OR "telecare*" OR "telemonitor*" OR "remote consult*" OR "remote monitor*" OR "televideo*" OR "teleconsult*" OR "e-consult*" OR "econsult*" OR "telemedical*" OR "telepsychiatr*" OR "remote sensing technolog*" OR "virtual hospital*" OR "teleconferenc*" OR "video conferen*" OR "videoconferenc*" OR "telediagnos*" OR "telenursing" OR (("online" OR "on-line" OR "digital*" OR "electronic" OR "computer*" OR "software" OR "internet*" OR "web" OR "website*" OR "technology-based" OR "interactiv*" OR "telecommunicat*" OR "information and communication technolog*" OR "ICT") W/4 ("support" OR "self help" OR "chat" OR "communicat*" OR "self care" OR "self manag*" OR "stress management" OR "self efficac*" OR "intervention*" OR "education*" OR "training" OR "learning" OR "teaching" OR "health information*" OR "patient information*" OR "information service*" OR "therap*" OR "lifestyle*" OR "life style*" OR "motivat*" OR "healthcare" OR "health care" OR "complian*" OR "adheren*" OR "monitor*" OR "delivery" OR "behaviour*" OR "behavior*" OR "health promotion*" OR "home health*" OR "home care" OR "counsel*" OR "decision" OR "tool*"))))

Results: 903

ProQuest: (Health & Medicine, Social sciences, education)

noft((father* or dad* or stepfather* or puppa*) AND ("webcast*" OR "podcast*" OR "mobile application*" OR "smartphone*" OR "iphone" OR "android" OR "text messag*" OR "app" OR "apps" OR "virtual reality" OR "ipad*" OR "tablet comput*" OR "tablet device*" OR "instant messag*" OR "SMS*" OR "whatsapp" OR "Youtube*" OR "video gam*" or e-health* OR

"ehealth*" OR "electronic health*" OR "e-technolog*" OR "etechnolog*" OR "digital health*" OR "digital technolog*" OR "mobile health*" OR "mhealth*" OR "m-health*" OR "e-learning*" OR "elearning*" OR "e-medicine*" OR "emedicine*" OR "e-therap*" OR "etherap*" OR "health information technolog*" OR "e-support*" OR "Telemedicine" OR "telehealth*" OR "telecare*" OR "telemonitor*" OR "remote consult*" OR "remote monitor*" OR "televideo*" OR "teleconsult*" OR "e-consult*" OR "econsult*" OR "telemedical*" OR "telepsychiatr*" OR "remote sensing technolog*" OR "virtual hospital*" OR "teleconferenc*" OR "video conferen*" OR "videoconferenc*" OR "telediagnos*" OR "telenursing " OR ("online" OR "on-line" OR "digital*" OR "electronic" OR "computer*" OR "software" OR "internet*" OR "web" OR "website*" OR "technology-based" OR "interactiv*" OR "telecommunicat*" OR "information and communication technolog*" OR "ICT") NEAR/4 ("support" OR "self help" OR "chat" OR "communicat*" OR "self care" OR "self manag*" OR "stress management" OR "self efficac*" OR "intervention*" OR "education*" OR "training" OR "learning" OR "teaching" OR "health information*" OR "patient information*" OR "information service*" OR "therap*" OR "lifestyle*" OR "life style*" OR "motivat*" OR "healthcare" OR "health care" OR "complan*" OR "adheren*" OR "monitor*" OR "delivery" OR "behaviour*" OR "behavior*" OR "health promotion*" OR "home health*" OR "home care" OR "counsel*" OR "decision" OR "tool*"))))

Source type

Scholarly Journals, Dissertations & Theses, Government & Official Publications, Reports, Language English

Results from the databases:

Database	No. results retrieved
Ovid Medline (1946 to present), Epub Ahead of Print, In-Process & Other Non-Indexed Citations, and Ovid MEDLINE Daily	518
CINAHL (EBSCOhost)	258
PsycInfo (Ovid)	1062
Ovid Emcare (1995 to present)	446
ProQuest	1044
Scopus	903
Total before duplicates removed	4231
Total after duplicates removed	3184*

Searches run on 7/09/2018

Appendix B.

Summary of the characteristics and findings of all included papers ($N = 68$): separated by father-focused versus mother-included.

Papers focused only on interventions / programs and experiences of fathers transitioning to parenthood

	Author (s) & Year:	Aim:	Study / Participant (father) Details:	Results:
1.	Ammari et al. (2015)	To explore how fathers go online via social media (e.g., Facebook or Reddit) to document and archive fatherhood, learn how to be a father, and access social support.	$N = 37$ experienced fathers Age: Not-specified Child: Not specified Country: Not-specified Design: Qualitative, semi-structured interviews	-Motivations for social media use depend on setting and context (e.g., fathers tend to rely on social support – both online and offline – when their children were younger). -Fathers avoid offering advice on what they deem a controversial topic (e.g., sleep training, vaccinations and breastfeeding).
2.	Asenhed et al. (2013)	To identify and describe the process of fatherhood, via analysis of blogs from the Internet .	$N = 11$ first-time fathers Age: 22-34 years ($Mdn = 28$) Child: Expectant Country: Sweden Design: Explorative qualitative study	-Results were divided into five categories: (1) the pregnancy, (2) a new life, (3) to make the child real, (4) preparations for the delivery and the arrival of a new child, and (5) a new role in life. -Fatherhood was described as an "emotional roller-coaster ride" -Several fathers talked about feelings of hope and joy about being a father; feeling excluded from antenatal centres; concerned about the safety of purchases for their child; nervous and restless during the lead up to labour; fearful and anxious of their role in the delivery room; anxious to not make the same mistakes as their own fathers
3.	Benzie et al. (2015)	To explore the experiences of first-time fathers of late-preterm infants and their perceptions of the Father-Infant Interaction Program (FIIP) .	$N = 85$ first-time fathers Age: 19-49 years (Range, M and SD varies across intervention / control group) Child: 8 months (late-preterm) Country: Canada Design: Qualitative analysis of RCT data, with semi-structured interviews	-Thematic analysis of the data revealed three themes: (1) Fathers believed they had the "best job in the world," yet saw fathering as the "biggest job ever." (2) Fathers viewed fatherhood as an opportunity for personal growth. (3) Fathers in both the IG and CG liked the convenience of the home visits and validation of their role as a father. IG fathers liked tailored feedback about play.
4.	Bourget et al. (2017)	To evaluate an educational intervention (prenatal classes) aimed at addressing: (1) definition, components, and importance of the paternal role, (2) changes associated with fatherhood, (3) support and understanding the partner, and (4) infant care and needs.	$N = 6$ fathers Age: 30-42 years ($M = 34.5$, $SD = 4.5$) Child: Expectant Country: Canada Design: Questionnaires and open-ended questions	-Content and format of the intervention was well-received. -Benefits demonstrated for both first-time fathers and experienced fathers. -The open-ended questions revealed that participants appreciated discussing with other fathers ($n = 4$) and interacting with experienced fathers ($n = 3$). -Appreciated receiving advice ($n = 2$) in addition to useful ($n = 1$) and tailored ($n = 1$) information for fathers, as well as participating in practical activities ($n = 2$).
5.	Boyce et al. (2007)	To identify predictors of distress in fathers	$N = 213$ fathers Age: Not specified Child: Mother 20 weeks pregnant Country: Australia Design: Longitudinal Cohort Study	Fathers were at risk of being distressed who: -Had insufficient information about pregnancy and childbirth -Had a partner with an unplanned pregnancy or left to chance -Had unclear birth expectations and have been given reports or mixed experiences from other men
6.	Crumette et al. (1985)	To report results from the Father-Infant Interaction Program (F-IIP) ; the intervention is aimed at (1) increasing newborn knowledge, (2) encouraging discussion of concerns and feelings, and (3) increasing interaction time between father and infant.	$N = 11$ fathers Age: Not specified Child: Expectant (parents in Lamaze classes) Country: Not specified Design: Pre-test Post-test Evaluation	-The program was effective in (1) expanding first-time fathers' knowledge of newborn characteristics and behaviour; and (2) increasing the frequency of the fathers' talking to the infant, smiling at the infant, and establishing eye-to-eye contact with the infant -Fathers evaluated the program's content and purpose positively -Father-focused classes should be offered at a convenient time for fathers. -Classes should (1) focus upon the newborn's sensory abilities and potential for interaction; and (2) provide fathers with the opportunity to learn and to practice sensory interaction skills and care giving activities for their infants.

7.	Da Costa et al. (2017)	To describe the needs of expectant / new fathers, their perspectives of barriers to seeking help for emotional wellness, their informational needs, and factors affecting their decision to visit a source – in order to inform the development of a new website (HealthyDads.ca) for men.	N = 174 fathers Age: $M = 34.6$, $SD = 4.5$ Child: Expectant or recently born Country: Canada Design: Descriptive web-based survey	-Pregnancy may be a “teachable moment” for dads -Factors influencing fathers to visit the website for the <i>first-time</i> include: a clear navigation structure and scientific-based content / credibility. -Factors influencing fathers to <i>prolong</i> a visit include: a desire to improve knowledge, experiencing the website as rewarding, ease of understanding, being free of charge, information to help dads adjust and engage in healthy behaviours, and an attractive layout. -Factors influencing fathers to <i>revisit</i> the website were both web- and user-related and include: the opportunity to post question to a health professional, regular new content and personal commitment
8.	Deater-Deckard et al. (1998)	To examine the rates of depressive symptoms in fathers preceding and following childbirth, and explore the role of stressful life events, social and emotional support, the quality of the partner relationship and socioeconomic circumstances.	N = 7,018 fathers (partners of women in the Avon Longitudinal Study of Pregnancy and Childhood) Age: Not specified Child: expectant and 8 weeks postpartum Country: UK Design: Correlational	-Men in stepfamilies may be at a greater risk for depression than those in traditional families -This risk is closely linked to their partners' depressive symptoms, less education, more life events, less social support, smaller social networks and more aggressions within their partnerships -However, men's depressive symptoms did not increase following the birth of a child.
9.	Durette et al. (2001)	Aims to characterise health related outcomes for fathers of new children (e.g., general health, affect, and sexual function.)	N = 126 fathers Age: 18-40+ Child: ≤ 4 years Country: USA Design: Cross-sectional (online surveys)	-Fathers exhibited poor scores on the General Health Questionnaire and Kessler Distress Scale and high negative affect compared with normative data -Sleep, exercise, and alcohol consumption patterns appear to be influenced by fatherhood -Fathers reported comparable relationship satisfaction, sexual desire and sexual activity with normative data, but markedly lower sexual enjoyment without and with a partner -Study demonstrated that fathers can be recruited through an Internet study
10.	Eriksson et al. (2013)	To describe communication about caring activities for infants among men who visited an Internet-based forum for fathers, and elaborate on the dimension of support available in the forum.	N = 1203 pages of data from an internet forum Age: unable to report Child: unable to report Country: Scandinavia Design: Archival and cross-sectional observational study	-Fathers highly rated the reciprocal sharing of concerns (e.g., how to be a better father in caring for an infant) and feelings of joy and distress in everyday life -Fathers use the Internet to gain information from others in similar situations.
11.	Everett et al. (2006)	To use telephone surveys to assess expectant fathers' health risk behaviour (e.g. cigarette smoking, physical activity, fruit / vegetable intake etc.) and their attitudes about pregnancy related health issues.	N = 138 low-income rural fathers Age: $M = 26.6$ Child: 21 weeks' gestation Country: USA (Missouri) Design: Cross-sectional prevalence study	-Pregnancy may be a “teachable moment” for fathers -This sample of expectant fathers engage in high rates of health risk behaviours e.g. 49.3% smoked cigarettes; 30.4% engaged in hazardous drinking in the past month; 27.5% had very low physical activity levels; 94.9% had at-risk fruit / vegetable intake; and 42% had weight-related health risk. -47.9% of the men engaged in three or more of five assessed health risk behaviours.
12.	Fletcher et al., (2017)	To assess the acceptability, feasibility and sustainability of intervention of <i>StayinOnTrack</i> , an adaptation of <i>SMS4Dads</i> - a mobile phone-optimised, SMS-based informative and interactive telephone-linked support system for new fathers – for use with young Aboriginal fathers.	N = 20 young Aboriginal fathers (co-investigators for project) Age: 18-25 years. Child: “young” (at least one) Country: Australia Design: Qualitative Feasibility study	-Evaluation feedback was overwhelmingly positive, particularly the opportunity to network with other fathers. -The development of the culturally appropriate web-resource reinforced community pride. -Internet- and mobile phone-based resources developed in close partnership with the Aboriginal community offer viable, acceptable and sustainable support mechanisms for young Aboriginal fathers. -Young fathers view themselves as mentors and role models within the community.
13.	Fletcher et al. (2017)	To assess the uptake, user engagement and acceptability of a mobile phone-optimised, SMS-based, informative and interactive telephone-linked support system / intervention for new	N = 40 fathers Age: 21-59 years ($M = 33.7$) Child: expecting within 6 months or infant <3 years Country: Australia	-Tentative support found for use of SMS. -Percentage of use of embedded website clicks: <i>Becoming a dad: a big adjustment</i> (22%) of clicks, and <i>Talking to your baby</i> (14%) of all clicks. Least frequently clicked links regarded <i>Services and support</i> , <i>Your baby is reading your face</i> , and <i>Dads' mental illness</i> .

		fathers, to inform the development of SMS4Dads .	Design: Mixed methods pilot study testing intervention (baseline measurements of distress taken, post-intervention structured phone interviews ($n = 19$) / with Likert-scale questionnaires).	-Using a mood tracker and measure for distress, concerning levels of psychological distress were detected in several participants -All interviewed fathers stated they would highly recommend SMS4Dads to new fathers. However, 6 out of 40 requested that the text messages be stopped. -Over half of the interviewed fathers (58%) rated the Mood Tracker favourably – however, one participant reported it was 'too frequent'
14.	Fletcher & May (2016)	To overview the background, development, study design, results, feedback from fathers, future projects, publications, key learnings and recommendations from the SMS4Dads project (smart-phone based messaging service for new fathers offering fathering information, mood assessment and tailored telephone and online support	Country: Australia Design: Beyondblue report	-See report.
15.	Fletcher et al. (2008)	The study aimed to evaluate email and Internet delivery of tailored information for dads and fathers' readiness to utilise it. Information covered seven topics: baby play, breastfeeding, postnatal depression, father-infant bonding, sex after birth, work-family balance, and fussy babies.	$N = 105$ fathers from antenatal classes Age: $M = 33$ years Child: expecting Country: Australia Design: Quantitative web-based survey	- The most popular topics for fathers were those that related to father-infant interaction (e.g. baby games and bonding) -The least popular topics were breastfeeding and sex after birth. -Most respondents (78%) indicated that the information changed their approach to fathering.
16.	Giallo et al. (2017)	Online survey aimed to (1) identify attitudinal barriers to help-seeking for mental health difficulties among fathers of young children, (2) explore the relationship between perceived barriers and mental health difficulties, (3) identify socio-demographic factors associated with barriers to help-seeking and 4) identify fathers' preferences for mental health support .	$N = 154$ fathers, with at least one child Age: 21-59 years ($M = 31.07$, $SD = 6.57$) Child: 0-8 years (44.2% of fathers had children 0-2 years, 40.9% had children 3-4 years, 14.9% had children 5-8 years) Country: Australia Design: Cross-sectional study (Online survey)	- The majority of fathers did not feel comfortable accessing different modes or sources of support. -Most common preferences for support were internet-based information resources, followed by support provided by general practitioners and maternal child health nurses. - <i>The Need for Control and Self-reliance, Barriers to engagement and Distrust of Caregivers</i> were moderately associated with higher levels of depressive, anxiety and stress symptoms.
17.	Grant et al. (2001)	To evaluate outcomes of FatherWork – a web-based intervention , which uses real-life stories or narratives to motivate and provide high quality education to fathers – through a medium that can reach millions.	Quantitative Aspect: Due to the voluntary nature of this part of the study, there were various sample sizes for each specific feedback question related to: the <i>Cognitive Dimension</i> (i.e., gave them helpful ideas): $n = 236$, the <i>Affective Dimension</i> (i.e., affected them emotionally): $n =$ not specified, the <i>Behavioural Dimension</i> (i.e., motivation to be better): $n = 231$, and the <i>Moral Dimension</i> (i.e., commitment): $n = 227$ Qualitative Aspect: $N =$ unclear (75 – 80 % of responses were from fathers, the rest from practitioners) Age: Not specified ** Country: Not specified	-Many users visit the site in the late afternoon on weekdays -Most popular educational modules were: <i>Fathering Across the Life Span</i> , <i>Fathering Teenagers</i> and modules on <i>infancy and the toddler years</i> . **Demographics are not given for the current study, but basic demographic information on World Wide Web Users is provided generally. (34% of users are aged 35-44 years and 61% are male)

			Design: Mixed methods case study website evaluation (quantitative feedback questionnaire)	
18.	Hinckley et al. (2007)	To investigate the needs of expectant fathers and to determine whether television can be implemented as an intervention to provide parent guidance to South African expectant fathers, during the transition to parenthood.	Phase One: $n = 65$ South African expectant fathers (telephone survey / purposive sampling) Age: 20-54 years Child: expecting Phase Two: $n = 4$ (in-depth, individual, face-to-face interviews / purposive sampling) Age: 24-33 years Child: expecting Country: South Africa Design: Two-phased mixed- methods evaluation of intervention	-Fathers wish to receive guidance to develop certain basic childcare skills (e.g., handling an infant, changing nappies, feeding and bathing) -83% of the respondents perceived television to be the most suitable medium for providing them with such guidance. Other media deemed suitable were books (15%), magazines (15%), newspapers (12%), radio (11%), the Internet (9%), professionals (6%) and DVD/video (2%). <i>Fathers' Recommendations:</i> -A programme for expectant fathers should be appealing, practical and presented at a convenient time. -43% of the respondents selected an interactive talk show as preference, followed by 18% who chose a documentary.
19.	Hudson et al. (2003)	To evaluate New Fathers Network, an Internet-based intervention that contains an online library of information, discussion forums and electronic mail access to advanced practice nurses to improve first-time fathers' parenting self-efficacy / parenting satisfaction during the transition to parenthood.	$N = 34$ first-time fathers (convenience sample) IG: $n = 14$; Age: 23-38 years ($M = 29.6$) CG: $n = 14$; Age: 20-38 years ($M = 28.2$) Child: 8 weeks postpartum Country: USA Design: Quasi-experimental repeated measures	-Participants were primarily satisfied with the intervention (fathers indicated it was easy to navigate, easy to find topics of interest and that the library was organised). -Fathers valued their opportunity to participate in an asynchronous discussion group with other fathers. Fathers in the IG expressed their desire to continue discussion with other fathers for longer than 1 month. -Parenting self-efficacy and satisfaction scores of the IG significantly improved from 4 to 8 weeks, but did not for the CG.
20.	Katch (2012)	To investigate how fathers' well-being is impacted by infant crying and fussing, as well as how fathers experience crying and how they cope, using measures of depression, parenting stress, parenting self-efficacy and coping , followed by semi-structured phone interviews.	Quantitative Demographics: $n = 192$ fathers Age: 26-35 years (62%) Qualitative Demographics: $n = 10$ fathers (both first-time and experienced) Age: 24-40 years ($M = 32$). Child: Infants aged 1-10 months ($M = 6$ months) Country: USA Design: Mixed-methods sequential explanatory qualitative / quantitative study design (Dissertation)	-30% of father indicated that they were finding their infant's crying and fussing to be a problem or upsetting. -Perception of crying was a significant predictor of parenting stress, depression and parenting self-efficacy -Fathers' perception of infant crying has a greater impact and is a stronger predictor of father wellbeing than the amount of crying reported (i.e., colic criteria) -Fathers confronted with inconsolable crying described feelings of 'losing control' and a process of cognitively reappraising the situation and the infant behaviour as a method of coping. -Interview fathers relied heavily on the co-parent as a source of support -Possible support services for fathers in these situations were unknown to interview fathers.
21.	Johansson et al. (2013)	To describe men's perceptions and feelings of staying with their partner and new baby in the context of having experienced a surgical birth .	$N = 21$ fathers (already part of a prospective longitudinal cohort study) Age: Not specified Child: 7-16 months old (elective or emergency caesarean section birth) Country: Sweden Design: Qualitative descriptive study (telephone interviews)	-Thematic analysis revealed that the main reasons men considered it important they be facilitated to stay with their partners in this situation were; <i>being involved, receiving support, and providing support</i> - <i>Being involved</i> and <i>staying close to partner and baby</i> facilitated their sense of becoming a father - <i>Receiving support</i> was important for first time fathers who expressed feeling out of their depth with the "newness" of the situation. Experiences were "pleasurable" when fathers felt they could ask questions and receive information and explanations from staff - <i>Providing support</i> was important to these fathers, expressing that "being excluded" was "old fashioned", "hard" and "odd"

22.	Johansson et al. (2010)	To investigate the sources of pregnancy and childbirth information that expectant fathers use in pregnancy, with a specific focus on the Internet	N = 1105 fathers (48% first-time) Age: 25-35 years (73.1%). Child: expecting *36% were tobacco users. Country: Sweden Design: Cross-sectional observational study	-The most common sources of information, in order of preference, included: the midwife (85%), the pregnant partner (85%), antenatal information (71%), close friends with children (70%), and the Internet (58%). -First-time fathers accessed support from formal sources (i.e., midwives / nurses etc.) and informal sources (i.e., the Internet and one's mother) more often than fathers with previous children. -First-time fathers, fathers who have experienced a caesarean birth and those of a higher education were more likely to access the Internet.
23.	Lawrence et al. (2012)	To evaluate the brief, home-based Video-feedback Intervention to promote Positive Parenting (VIPP) (preventative) to determine its acceptability, and to improve on fathers' parenting capacities.	N = 5 fathers (recruited from existing longitudinal study of parents) Age: 36-53 years Child: 6-15 months Country: UK Design: Feasibility study (with pre- and post-intervention measures) followed by semi-structured questionnaires.	-Fathers rated the intervention as having had a significant impact on their understanding of their child's thoughts and feelings -Improved their communication and relationship with their baby -Flexibility to conduct sessions at home (or at fathers' places of work) and flexibly timing of sessions were identified as fundamental to successful delivery.
24.	Lee & Walsh (2015)	To test the acceptability and usability of mDad (Mobile Device Assisted Dad) with military fathers and beta users – a smartphone application (app) attempting to provide a father-friendly tool to help new fathers learn about and engage with their infants and toddlers.	Usability of mDad (<i>n</i> = 4 men, age: not specified) Acceptability of mDad military fathers (<i>n</i> = 9 military fathers, age: not specified, child: ≤3 years) Acceptability and Usability with mDad Beta Users (<i>n</i> = 4 beta users with various military experience, age: not specified, child: 'young') **Exclude Acceptability Focus Groups with Urban, African American Fathers (child: newborns-32 years of age) Country: Not specified Design: Exploratory descriptive case study (online surveys, semi-structured interviews and focus groups)	Results (military fathers): -mDad was rated as interesting and relevant to fathers -Activity suggestions were welcomed enthusiastically -Fathers like the friendly and non-pedantic tone, the brevity and specificity of the messages, and found certain features highly engaging, i.e., shared participation with a co-parent and virtual tracking of their child's development -Fathers recommended that content be more tailored (e.g., ideas for activities a father with both a new child and an older child could incorporate for both) Results (Beta users): -App content: interesting, useful, relevant to parenting experiences and needs -Functions: logging a child's developmental milestones, and receiving tailored parenting education were perceived as favourable. -Tone: both educational and humorous was well received. -Features: Brief messages were rated as more useful than long books or dense websites where one has to sift through the relevant information: "I get sick of apps that send too much information or send things too often..." -Delivery: was rated highly for its accessibility and availability. -Timing of messages (Thursdays and Fridays) was rated as highly favourable; fathers reported that the messages helped to "plant the seed for things to do over the weekend when they had the most family time". -Participants felt the app would be <i>most useful</i> for first-time fathers, but also for more experienced.
25.	Letourneau et al. (2011)	To describe the experiences, support needs, resources, and barriers to support for fathers whose partners had experienced postpartum depression (PPD)	N = 11 fathers** with partners with PPD (convenience sample) Age: 29-44 years (<i>M</i> = 37) Child: ≤24 months post-partum Fathers were from New Country: Canada Design: Descriptive pilot case study (semi-structured telephone interviews) **2 of the fathers reported they had lost a child within the first year of life.	-A common experience among fathers was feeling an inability to interpret what was wrong with their partners. -Most common barriers to accessing support found were: not knowing where to look for PPD resources, stigma linked to PPD (e.g., 'horrible' examples in the media), difficulty reaching out to others / a 'strong, stoic guy thing', 'naively [thinking] everything was okay', lacking time and energy, work commitments and transportation challenges, being ignored and excluded by health care professionals when attempting to contribute to partner's care and feeling like they had no one to talk to about their own symptoms. -Fathers' coping behaviours included: staying active, getting exercise, getting out of the house, self-isolation or avoidance of social situations. -Most fathers attempt to be self-reliant, such as 'digging for information' on PPD due to the large information gap on recognition / early detection.

				-Support needs helpful to fathers included: gaining friends' insight into how they coped with similar experiences as helpful and appreciating when others appeared interested in their wellbeing.
26.	Letourneau et al. (2012)	To describe the support needs and preferences for support of fathers how partners have had PPD.	N = 40 Fathers, whose partners have had PPD. Age: 23-46 years (M = 37) Country: Canada Design: Two-phased exploratory descriptive qualitative study (one-to-one semi-structured telephone interviews with follow-up)	-Fathers desired support from both formal and informal sources -Ideal interventions should touch on: information on PPD and practical tips on how to cope with their partners PPD -The authors recommend that the ideal PPD intervention does not favour any one setup -The authors recommend that the program should be multi-tiered, accessible and flexible.
27.	Mackert et al. (2017)	To explore the perceived role of men in prenatal health, the use of an e-health application , and suggestions for improvement.	N = 23 fathers Age: M = 26 Country: USA Design: Mixed-methods pilot evaluation (quantitative surveys and qualitative semi-structured interviews) of an intervention	-Barriers to involvement: time and availability concerns (misconception that prenatal classes are only available during the work week at inconvenient times), feeling a physical 'disconnect' -Factors rated highly: the useful / interesting information, 'engaging' features i.e., graphics (e.g., for visual foetal development metaphors, the majority of participants preferred fruits and vegetables images (61%), over sports-themed images (39%)) -Suggestions for improvements: add videos and interactive modules, add a function to input personal information and personalise the experience (font size and colour), add external links to reputable health care websites or drop-down content for further reading
28.	Pfannenstiel et al. (1991)	To determine the effectiveness of a prenatal intervention (Information and Insights about Infants (III) intervention program) with low socioeconomic, first time fathers who partners were experiencing a high- or low-risk pregnancy.	N = 67 fathers Age: 19-32 years (M = 22.46) Child: perinatal period (2 nd month of pregnancy-1 month postpartum) Country: USA Design: Pre-Post Test Design (random assignment)	-Provided tentative support for the feasibility of the intervention, notably successfully when women enlisted their partner's participation. -Fathers in the IG were more attuned to father-infant interactions in the feeding situation that those in the CG. -Sustained long-term supports after the birth of the infant may be needed in order to optimize father-infant interactions for this population.
29.	Price (2001)	To explore what fathers like and want to get out of a ' Dad's Evening - aimed at facilitating the formation of friendships between new fathers within the local community, encouraging the promotion of support networks, and using the opportunity to promote male health and to explore ideas about fatherhood, changing identities and relationship and the continuing role of gender within child rearing.	N = 46 fathers Age: Not specified Child: 4-12 weeks postpartum Country: UK Design: Commentary and evaluation of 'dads' evening with feedback forms.	-Time and venue of sessions (8pm week night) were deemed suitable and convenient. -All fathers indicated they would recommend the group to other new fathers. -Fathers came to the evening to: 'meet other fathers' (42%), 'partner' (25%), and 'baby resuscitation' (27%). -Most useful part of the evening was: 'baby resuscitation' (58%) and 'getting to know other dads' (33%) -Least useful part: men's health (the majority) -Suggestions for improvement included: increasing number of evenings, increasing the amount of unstructured talking time, more information on infant illness, advice about childcare and schooling, information about prostate cancer, and the effects of a difficult birth.
30.	Rominov et al. (2018)	To explore men's experiences of seeking mental health support and support for their parenting in the perinatal period, and identify their support needs during this time.	N = 20 fathers Age: M = 33.9, SD = 3.2 Child: either expecting or infant <2 years) Country: Australia Design: Descriptive qualitative study (individualised semi-structured face-to-face or telephone interviews)	(1) Fathers experienced lack of father-specific information (resources found to be mother-centric). Attitudes of health professional generated feelings of exclusion. Informal support (i.e., friends and family) was the most common source of support. Fathers often only accessed perinatal resources after being influenced by a partner or friends. (2) Fathers identified an array of support needs: felt unprepared for sleep deprivation; needed additional support during the early stage of pregnancy; additional support for un-planned events; reputable sources. Preferences for the best format to receive information and support varied (e.g., father's groups, antenatal classes facilitated by a father, services being provided outside of business hours, visual demonstrations, online information and hard copy resources). (3) Barriers to support (stigma associated with men's help-seeking, and inflexible work arrangements) (4) Facilitators to support (making resources and attitudes of educators / health professionals more father-inclusive was noted as a strategy; heightening awareness i.e., targeted campaigns)

				(5) Timing of support (fathers often learn as they go, seeking out practical information in response to a specific situation; there is a tension between fathers' desire to be more included in perinatal services, but also to "wing it")
31.	Self-Brown et al. (2015)	To assess the feasibility, acceptability and impact of the intervention / program (Dad2K) – wherein computer software and home visits are utilised to targets positive parenting skills and the prevention of child neglect and physical abuse, and in doing so, inform a randomized-controlled trial.	<i>N</i> = 4 African American 'at-risk' fathers (either young, low-income, low-educated, single parent) Age: Not specified Child: 18 months-5years Country: USA Design: Descriptive observational and qualitative study of Pilot Data from the Dad2K program.	-Fathers were on average satisfied to very satisfied with the program, particularly the technology-assisted components of the intervention -A hybrid approach (i.e., using technology and a provider) is a feasible way to engage fathers in a behavioural parent training program
32.	Shorey, Ang, & Tam (2018)	To evaluate the efficacy of quantitatively-studied informational support-focused interventions for fathers, using paternal outcomes only.	<i>N</i> = 17 studies with 18 interventions (RCTs, pre-test and post-test, and quasi-experimental) Age (fathers): >18 years. Child: antenatal or postpartum period Country: Not specified Design: Systematic Review, Narrative Synthesis	-The method of delivery for these interventions was mostly face-to-face -Limited father-inclusive interventions were available -Only 7 studies were solely father-focused interventions -Interventions carried out across the perinatal period with longer follow-up periods were recommended for interventions providing informational support for fathers.
33.	Shorey, Dennis, Bridge, Chong, Holroyd et al. (2017)	To explore first-time fathers' postnatal experiences and support needs in the early postpartum period.	<i>N</i> = 15 first-time fathers (purposive sampling) Age: <i>M</i> = 31, <i>SD</i> = 3.55 Country: Singapore Design: Descriptive qualitative study (semi-structured face-to-face interviews)	4 overarching themes and 17 subthemes: (1) <i>No sense of reality</i> (in the first 2 weeks post-delivery) slowly adapting to a <i>sense of responsibility</i> towards partner and newborns (2) <i>Unprepared and challenged</i> (many fathers unaware of antenatal classes offered in hospitals, were unprepared for sleep deprivation, fathers felt confused from receiving varying advice from professionals / family) (3) <i>Support: needs</i> (baby care tasks, wanting feedback on tasks), <i>sources</i> (informal support from family, friends, social media and YouTube), <i>experience</i> (almost all fathers felt "left out" by nurses, Chinese fathers felt highly pressure to follow cultural traditional rituals) and <i>attitudes</i> (varied depending on ethnicity and culture – fathers as the "breadwinner") (4) <i>Future help for fathers</i> (suggestions included: father-focused educational interventions in the 2 weeks post-delivery, focus groups with other fathers, continuous care from doctors / nurses, mobile-phone applications for convenience and with the option for interactive sessions, and advertised antenatal educational programs)
34.	Sioma-Markowska et al. (2016)	To analyse paternal activity during child birth and preparation	<i>N</i> = 250 fathers Age: not specified Child: 1 day after childbirth Country: Poland Design: Prospective survey-based quantitative study	-Fathers who prepared for childbirth in antenatal classes were more likely to play a supportive role during each stage of childbirth -The dominant form of preparation involved self-education form books, magazines and the Internet (24%). -23.6% of fathers participated in antenatal classes.
35.	White et al. (2018)	To examine how new and expecting fathers engage with and use a breastfeeding conversation forum within a mobile application "Milk Man" during the perinatal period.	<i>N</i> = 208 forum contributors (fathers) <i>n</i> = 187 fathers (with demographic details) Age: <30 (15.5%), 30-34 years (47.1%), ≥35 years (37.4%) Child: perinatal Country: Australia Design: Qualitative Analysis of RCT data (Maycock et al. 2015)	-Fathers are prepared to use such a forum -The forum was used: to seek and offer support, to share experiences (sometimes very personal information e.g., miscarriage / intimacy with partner), to build connection (i.e., "join in"), and to offer informational support -Posting in the forum was concentrated in the antenatal period up to approximately 6 weeks postpartum

36.	Wynter et al. (2016)	To identify factors associated with father-infant attachment at 4 and 6 months postpartum.	N = 330 men completed baseline interviews n = 270 completed follow-up interviews. Age: M = 33.1, SD = 5.6 Child: 4-6 months postpartum Country: Australia Design: Mixed methods community-based study (telephone interviews and survey data)	-Poorer quality father-to-infant attachment was significantly associated with personality traits like oversensitivity, more symptoms of depression and anxiety, poorer quality partner relationship, and more frequent partner criticism of infant care (p = 0.01).
37.	Xue et al. (2018)	To examine factors influencing first-time fathers' involvement in wives' pregnancy and childbirth in Singapore.	N = 182 first-time fathers Age: 21-54 (M = 32.25, SD = 4.92) Child: childbirth Country: Singapore Design: Cross-sectional descriptive correlational study	-Fathers were generally involved in their wives' pregnancy and childbirth -35.2% of the sample were highly involved -Logistic regression showed the level of informational support was the only significant factor that influenced first-time fathers' high levels of involvement in their wives' pregnancy and childbirth.

Note. IG = Intervention Group; CG = Comparison / Control Group

Papers focused on interventions / programs / experiences of fathers and mothers transitioning to parenthood (i.e., co-parenting)

	Author (s) & Year:	Aim:	Study / Participant (father) Details:	Results:
38.	Abbass-Dick et al. (2017)	To design and pilot test an interactive eHealth breastfeeding co-parenting resource developed to target both mothers and fathers.	N = 149 pregnant or new mothers and their partners. (Phase I: mothers n = 16 and fathers n = 15; Phase II: mothers n = 31 and fathers n = 35; Phase III: public health nurses n = 29, childbirth educators n = 6, lactation consultants n = 5, midwives n = 4 and other n = 10 and parents from phase II) Age (Phase I): 20-29 years (27%), 30+ years (73%) Age (Phase II): M = 31 (mothers), M = 32 (fathers) Age (Phase III): Not specified Child: expecting or new (≤6 months) Country: Canada Design: Three phased pre-test post-test pilot study	-Maternal and paternal breastfeeding self-efficacy and knowledge and infant feeding attitude scores all increased from pre-test to post-test, but no difference found in the co-parenting relationship scores -Top content areas were rated as: 'the benefits of breastfeeding', 'how to know your baby is drinking well at the breast,' and 'what to expect in the first few days' -Fathers particularly liked topics on how to be involved with their infant and support breastfeeding -Both parents and health professionals rated the resource highly for being well organised, innovative and representative of different cultures -Parents liked information presented with videos -The number of fathers in the study who felt the resource was targeting them (67%) and that it was an excellent resource (67%) was considered encouraging by the authors
39.	Bartholomew et al. (2012)	To measure mothers' and fathers' Facebook and Myspace use across the transition to parenthood, as well as their adjustment to parenthood	N = 182 couples (154 mothers and 150 fathers) Age (fathers): 18-48 years (M = 30.17; SD = 4.49). Child: 9 months postpartum Country: USA Design: Longitudinal survey design	-At the time of data collection, 127 mothers (82%) and 100 fathers (75%) had a Facebook account. -Mothers use Facebook more than fathers -Facebook use was not associated with parenting self-efficacy for either new mothers or fathers. -The majority of fathers used Facebook as the central means for connecting with their online friends. -Fathers reported better parental adjustment (and lower levels of parenting stress) when they reported connecting with more of their Facebook friends outside of Facebook. -Like mothers, fathers who perceived it more likely that their Facebooks friends would comment on photos they had posted of their child were more satisfied in the parenting role.
40.	Bennett et al. (2017)	To synthesise Social Connectivity Interventions for the Transition to	N = 27 papers (included in synthesis) **5 papers focused specifically on connections for fathers.	-The findings are described in four theme areas: (1) Connections in the community; (2) internet connections; (3) prenatal connections; and (4) connections for fathers.

		Parenthood and evaluate which ones work and under what conditions.	Age: unable to report Child: pre-birth to 1-year-old Country: Canada Design: Realist Synthesis	-The last theme was formulated from five papers regarding father-oriented social connectivity programs / evaluations. -The small number highlights the lack of such programs for fathers. -Barriers for fathers attempting to access programs are broken into two categories: organisation resistance (i.e., a failure of organisations to focus on fathers, and lack of funding) and father-perceived barriers (i.e., fathers' fear of judgement, and events that are mother-centric / designed for and organised by women). N.B., When these barriers were addressed, there was evidence that fathers engaged.
41.	Brown (1983)	To explore aspects of social support and health in expectant parents and compare the similarities and differences between husbands and wives in their experiences of support. The role of social support in the maintenance of health and promotion of positive outcomes during the perinatal period (and the negative input of stress and life change) is examined.	N = 313 couples (purposive sample) Age (fathers): 17-40 years (M = 26.6); Child: expecting in last 5 months of pregnancy (first child) Country: USA Design: Cross-sectional factor-search study with questionnaires (Dissertation)	-Network support was particularly valuable to pregnant women and this was transferred to their husbands -Men reported a consistently higher level of satisfaction with the support rendered by their partner -The study showed an association between social support and health and an interrelationship among physical symptoms, emotional symptoms, and wellbeing. -Men under great stress were less satisfied with other people's support
42.	Brown (1985)	To examine the influence of social support and stress on expectant mothers' and fathers' health (determined by testing and comparing different predictive models).	-313 couples -Refer to Brown (1986) for further demographic characteristics -Child: expecting -Country: USA -Design: Exploratory quantitative study	-Results from regression analyses indicated that social support and stress were useful in predicting health -Partner support appeared to be the most important variable in understand expectant fathers' health; wives provided the greatest substance of their husbands' interpersonal support needs -Whenever partner support was present for fathers, others' support did not making a significant contribution. Only in the absence of partner support was fathers' satisfaction with others' support notably increased
43.	Cheng et al. (2003)	To evaluate two web-based breastfeeding programs , developed to provide new parents with necessary information on proper breastfeeding techniques (one with plain text and one with graphics).	N = 20 (60% female, 40% male) Age: 22-49 years (M = 31.5, SD = 7.48) Country: USA Design: Evaluation of Program/ Intervention	-The study does not distinguish between mothers and fathers in the results. -The computer was viewed as a valuable learning tool -The program that contained graphics was preferred over the text-only program. -Subjects who viewed the text-only version first tended to give it a higher score than the people who viewed text with the graphics first. -Viewing time of the program was approximately 30-40 minutes – received well.
44.	Clark (2001)	To examine the transition to parenthood over four developmentally significant periods during pregnancy, in relation to the experiences and action of first-time parents , as well as perceptions of self and partner, and social and partner support.	N = 18 participants (9 couples) completed all four experimental sessions Age: Mdn = 30 years Child: New Country: USA Design: short-term longitudinal experimental design (dissertation)	-Results were obtained via a variety of methods: draw-a-person-tasks, pie charts and psychological distance maps, various questionnaires and a testing schedule -For husbands, roles of work and spouse were negatively correlated with increases in role of parent -Husbands' perceptions of support remained stable, but fathers, siblings, extended family and friends were perceived as more supportive. -Husbands' psychological distance from wives decreased, and wives were perceived as more supportive -While the wives' transition to parenthood was characterised by greater change than for husbands, the husbands' perception of role of parents is assumed to significantly influence the importance of the role of work and of spouse.
45.	Cronenwett (1985)	To look at changes in the content and structure of social relationships following the birth of the first child, and the differences between men and women – specifically changes in network structure, need for support, satisfaction with available support, access to support from network member, and stress and	N = 108 (54 couples - non-probability sample) in Phase I (third trimester) n = 100 completed Phase II (6 weeks postpartum [PP]) n = 92 completed Phase III (5 months pp) n = 69 completed Phase IV (8 months pp) Age: M = 27 years (women), M = 29 years (men) Child: expecting to ≤ 8 months postpartum	-For fathers, their network size decreased, the percentage of network members with preschool children increased, a higher percentage of their network members were offering emotional support, and there was an increase in the amount of overlap with spouse's network -Spousal relationships were perceived by 67% and 76% of mothers to contain greater positive support compared to the time before pregnancy -This relationship was also the source of increased stress and conflict for 45% of fathers and 47% of mothers.

		conflict in relationship with network member.	Country: USA Design: Four-phased experimental / quantitative study, followed by assignment to treatment vs. comparison group (randomisation is not specified)	
46.	Danbjørg et al. (2015)	To explore how postnatal parents experience the use of telemedicine (via a mobile app) following early discharge from hospital.	<i>N</i> = 38 (11 fathers and 27 mothers) Age (parents): 19-44 years (<i>M</i> and <i>SD</i> not reported) Child: new Country: Denmark Design: Intervention followed by semi-structured qualitative interviews	-Parents were confident in the use of the app -Parents did not experience any barriers in contacting the nurses via asynchronous communication and did not feel like they were disturbing any staff (a common concern of parents generally) -Parents felt that their follow-up support needs were met by use of the app -Parents viewed the app as a 'lifeline' -The app shows potential for enhancing self-efficacy and postnatal sense of security
47.	Diemer (1997)	To assess the influence of perinatal education / antenatal classes on stress, coping, and spousal relations, specifically comparing the effects of father-focused discussion classes with traditional childbirth classes	<i>N</i> = 83 couples (40 couples in the traditional classes, 43 couples in the experimental classes) Age (fathers): 19-39 years (<i>M</i> = 28, <i>SD</i> = 4.21) Child: expecting Country: Not specified Design: Quasi-experimental pre-test post-test study	-10 of the 43 couples (23%) in the experimental group had experienced a previous spontaneous abortion, whereas 3 of the 40 (8%) in the traditional group had experienced one. -Both groups accessed social support to cope from pre- to post-test, but this increase was greater for men in the father-focused group. -Fathers in the father-focused group showed significantly greater improvement in spousal relationships than those in traditional classes. -Expectant men's fathers were not the major network providers for emotional sharing and getting information. Social support from men's fathers was more likely to increase for fathers in the traditional class than the father-focused
48.	Fletcher et al. (2016)	To test the quality and acceptability of researcher-developed Short Message Service (SMS) messages designed to support fathers of infants aged 12 months or less.	Phase I: <i>n</i> = 6 experienced practitioners (developed draft text messages, which were then sent on to a panel of expert reviews (<i>n</i> = 15). Phase II: mothers (<i>n</i> = 56) and fathers (<i>n</i> = 46) evaluated text messages and provided feedback. Phase III: fathers (<i>n</i> = 21) were sent the testing SMS messages and 15 subsequently consented to participate in a phone interview, <i>n</i> = 106 parents completed demographic surveys. Age (fathers) <i>M</i> = 35.5 years; Age (mothers): <i>M</i> = 33.0 years Country: Australia Design: Three-phased feasibility study	-SMS items were easily understood by majority of the parents (97%) -Negatively rated SMS messages were considered as either poorly phrased, lacking enough information, or as not offering sufficient support. -Receiving the tests at different times was acceptable to fathers and the message content was relevant to their fathering.
49.	Fletcher & StGeorge (2011)	To examine asynchronous online chat rooms and determine how fathers request, offer and receive social support.	<i>N</i> = 24 men (who posted to the chat room) <i>n</i> = 22 women who posted replies to topics 24 men posted to the chat room *4 fathers were the predominant users Child: not specified Country: Australia Design: Qualitative	-Thematic content analysis was used to analyse 18 months of posts to a fathers' chat room on an Australian-based, government-supported parenting information Web site. -Self-disclosure and humour were characteristics of fathers' communication styles -The overarching purpose of communication was to make fathering more "visible" and to encourage each other to engage confidently and wholeheartedly in fathering.
50.	Gross et al. (1995)	To determine the effectiveness of a parent training program for promoting positive parent-child relationships among families of 2-year old.	<i>N</i> = 48 mothers, fathers and toddlers IG: 10 mothers, 10 fathers, 11 toddlers CG: 6 mothers, 6 fathers and 6 toddlers Drop-out: 7 mothers, 7 fathers, 7 toddlers	-IG fathers did not demonstrate significant improvements -40% of the fathers attended fewer than half the sessions and 50% completed none of the assignments -Fathers rate their children's behaviour as much less problematic than did mothers at each assessment point

		Parents were videotaped playing with their toddlers preintervention, postintervention and 3 months following the intervention.	Age of fathers (years): $M = 33$, $SD = 4.9$ Country: not specified Design: Randomized Control-Group Pre-Post- design with 3 month follow-up.	
51.	Henshaw et al. (2016)	To explore how couples notice, interpret and respond to mood changes in the first year postpartum, particularly communication about postpartum depressive symptoms .	$N = 39$ (16 fathers and 16 mothers in a relationship, and 7 single mothers) Age: 23-42 years ($M = 29.5$, $SD = 4.6$). Child: new to 1 year postpartum Country: USA Design: Exploratory Quantitative Analysis (with semi-structured interviews)	-Fathers felt unprepared to detect and support maternal PD symptoms, shared reluctance to seek formal treatment and collaborative action taken to improve the mother's mood. -Mothers and fathers agreed on fathers' general lack of knowledge, comfort and initial effectiveness in responding to significant mood changes. -Fathers whose partners had high EPDS scores expressed that they lacked the knowledge, resources, and skills to serve as consultant and supporter -Fathers described being self-reliant for information, but missing the depression warning signs
52.	Hurwitz et al. (2015)	To determine whether a service that delivered parenting tips via text message from the text-messaging intervention 'Parent University' could prompt parents of children enrolled in Head Start programmes to engage in more learning activities with their children.	$N = 253$ (76% mothers, 16% fathers, 8% grandparents, nannies etc.) IG: $n = 119$; CG: $n = 134$ Age: 18-71 years ($M = 31.91$, $SD = 9.71$) Child: 6 months - 5 years ($M = 3.40$, $SD = 1.22$) Country: USA Design: Quasi-experimental control group study evaluating outcomes	-Parents who received the service engaged in more learning activities; this was particularly true of fathers and parents of boys. -Parents reported high rates of satisfaction with the service. -In general, most participants in the sample liked the idea of incorporating cell phones into parenting interventions. Most (74%) indicated that text messages are a good way to receive parenting information -For the most part, mothers' and fathers' attitudes towards and use of the intervention were fairly similar.
53.	Lima-Pereira et al. (2011)	To describe the pattern of use of the Internet as a source of health information by participants of antenatal classes	$n = 21$ men ($n = 114$ women) Age (men and women): $M = 31.4$, $SD = 6.1$ Child: mother was 24-38 weeks pregnant Country: Spain Design: Cross-sectional Descriptive Study (self-administered questionnaire)	-The Internet was the most popular source of information on pregnancy topics after a physician (25.8% of men used it as their primary source of information). <i>Commercial websites</i> more frequently accessed than sites maintained by not-for-profit organisations or professional unions -Men reported more frequent searches on childbirth without pain (43% more than women), information about healthcare, care of women after childbirth (37%), relationships / sexuality / emotional support (12%), baby names and stages of childbirth -Men (83.3%) cited their family doctor as one of their first three sources of information about pregnancy, followed by the Internet (64.5%).
54.	Lindberg et al. (2007)	To describe parents' experiences of using videoconferencing (VC) when discharged early from a maternity unit (includes sounds and pictures with a midwife at the maternity department, on a round-the-clock basis during the first week after the birth).	$N = 9$ couples / new parents Age: not specified Child: very new Country: Sweden Design: Mixed-methods pilot study (quantitative questionnaires / qualitative semi-structured interviews) to evaluate intervention	-Parents felt confident with the VC equipment and enjoyed being test pilots for new and advanced technology -Most parents felt no threat to their privacy but some were uneasy as they were aware of the risk of hackers on the Internet (fathers particularly felt that meeting the midwife via VC sessions was less invasive of privacy than having a home visit) -Some fathers felt the VC meeting to be superficial, and this it should be voluntary.
55.	Majee et al. (2017)	To examine interrelational, organisational and community-level influences on how co-parents collaborate about infant and toddler feeding .	$N = 24$ mother-father dyads (interviewed together) Age: not specified Child: 6-36 months postpartum Country USA Design: Qualitative exploratory design (interviews and thematic analysis)	-Lactation consultants were the most common source of advice (for feeding practices) -Participants reported that feeding conflict was influenced by grandparents – stemming from intergenerational gaps. -A commonality expressed in interviews was that of negative attitudes to breastfeeding in public. -Parents' comments suggested that this perceived lack of support in the community may not only discourage women but also impact how the father support or discourage the mother
56.	Mindell et al. (2015)	To assess the primary concerns of parents / caregivers regarding their young child's sleep, who have submitted questions to an Ask the Expert feature of a publicly available iPhone / iPad app for sleep in young children .	$N = 1,287$ consecutive sleep-related questions were analysed Age: un-known Child: mean age of 10.9 months Country: not specified Design: Mixed methods	-Questions were most commonly submitted regarding infants (53.9%), newborns (23.7%) and toddlers (17.8%) -Fathers asked more questions about night waking and bedtime problems than other topics. -Almost no fathers asked about sleep training (1.44%) compared with mothers (9.37%).

57.	Niela-Vilén et al. (2014)	To explore and review Internet-based peer support interventions and their outcomes for parents.	N = 38 publications. Age: not specified Child: expecting or born (upper age limit not identified) Country: Not specified (authors assume Finland based on study authorship) Design: Systematic Integrative Review	-Most of the studies focused on Internet-based peer support between mothers ($n = 16$) or both parents ($n = 15$). Only 7 focused on fathers. -Internet-based peer support provided support for the transition to fatherhood, information and humorous communication. -However, mothers were more active users of Internet-based peer support groups than fathers. -In general, parents were satisfied with Internet-based peer support.
58.	Pilkington et al. (2018)	To review the impact of co-parenting interventions on paternal co-parenting behaviour , in regards to how partners relate to and support one another as parents.	N=16 RCTs that evaluated 14 co-parenting interventions. 9 of these interventions targeted parents during the perinatal period. Child: expecting or aged <18 years (*individual studies must be examined closely to ensure child is expectant or 'new') Country: Canada Design: Systematic Review	-Studies were only included for expectant fathers or fathers of children aged up to 18 years. -The review demonstrates the potential for co-parenting interventions to enhance father outcomes -Most interventions showed effects on relationship quality and father involvement but there was insufficient evidence regarding inter-parental conflict, dysfunctional parenting behaviour, and psychological distress and parenting efficacy. -The quality of evidence was low due to inconsistency and indirectness.
59.	Pilkington et al. (2017)	To describe the development of Partners to Parents, an online intervention for preventing perinatal depression and anxiety focused on enhancing partner support, and to investigate mothers' and fathers' perceptions of the usability of the website.	N = 12 (5 men and 7 women) Age (fathers): $M = 37.6$, $SD = 3.2$ Age (mothers): $M = 31.3$, $SD = 2.9$ Child: expecting and / or infant ≤ 24 months. Country: Australia Design: Usability testing and Descriptive Qualitative Analysis (Face-to-face interviews)	- <i>System quality</i> was rated positively and related to the personalisation of the website. Negative comments about system quality regarded navigability and layout ($n = 9$). <i>Content quality</i> was rated highly based on the usefulness of the information ($n = 8$). This was particularly the case for fathers. -Suggestions for improvement: improved navigability, simplification of content to improve readability, the inclusion of 'real-life' examples, and quizzes and interactive elements. -Barriers to use: unaware of its existence ($n = 6$), difficult to find through search engines such as Google. -Potential deterrents: a better rival website, lack of time, email log-in-only access, advertisements.
60.	Pilkington et al. (2015)	To review the current evidence for interventions that aim to reduce the risk of perinatal mood problems by addressing partner support .	N = 13 partner-inclusive interventions Age: not specified Child: expecting - ≤ 12 months postpartum Country: Australia Design: Systematic Review	-9 studies included fathers as participants in at least part of the intervention; only 5 studies reported on paternal outcomes; 4 interventions addressed partner support as one component of a broader psycho-educational programme. -Research evaluating the effect of interventions on paternal mental health are lacking. -Prevention efforts tend to position fathers as contributors to maternal mental illness, rather than acknowledging the potential for fathers to develop depression and anxiety symptoms themselves -The authors note: understanding the impact of antenatal classes is limited by their low attendance rates and high rates of attrition, and also because parents from minority groups are less likely to attend. Alternatives, such as strategies delivered online, should be explored.
61.	Shorey, Lau et al. (2017)	To examine the effectiveness of the 'Home-but not Alone' mobile-health application educational programme on parental outcomes (i.e., parental self-efficacy, social support, postnatal depression, and parenting satisfaction).	Intervention ($n = 126$) Control ($n = 124$) Age: $M = 32.66$, $SD = 5.03$ Child: new - 4 weeks postpartum Country: Singapore Design: Randomized-controlled trial two-group pre-test and post-test design	-IG had statistically significant improvements for parental self-efficacy, social support and parenting satisfaction at 4 weeks postpartum compared with CG -Postnatal depression scores did not show any significant improvement compared with the CG -Asynchronous communication between midwives and parents provided a form of verbal persuasion to parents, which in turn increased their decision-making and self-efficacy. -Participants reported they were satisfied with the program
62.	Shorey, Yang, & Dennis (2018)	To explore the views of parents of newborns with regard to the content and delivery of a mobile health (mHealth) app-based postnatal educational program; 'Home-but not Alone'	N = 17 participants who belonged to the intervention group of a RCT. (5 couples – fathers ($n = 4$) and mothers ($n = 3$)) Age (couples): 26-42 years Country: Singapore Design: Descriptive Qualitative study (with semi-structured interviews)	(1) Parents rated the app as a good informational resource, catering to the local context and new-generation parents. Information was tailored to individualised needs, was easy to access and allowed the recap of information. (2) Advices from midwives was considered by parents as reliable, reassuring, prompt and a facilitator for the decision-making process regarding care of their baby. (3) Using the app results in increased confidence and satisfaction in parenting. The app felt like a support mechanism between doctor's follow-up sessions and was like 'a friend' (4) Couples suggested that the duration of support needs to be extended, usability of the app needs to be promoted and content widened, as many parents felt the app was geared towards first-time parents

63.	StGeorge & Fletcher (2011)	To evaluate chat room posts on a father-specific, Australian-based, government-supported, parenting information Web site / Internet forum	<i>N</i> = 23 fathers (22 women posted replied to all but one of the topics) 5 fathers were expecting or were "new" fathers; 18 were experienced; and 6 were 'stay at home' dads. Country: Australia Design: Descriptive article	-Semantic analysis revealed that fathers complained about lack of playgroups and family services for them and their child -Fathers experienced apprehension for their new role (e.g., how to bond with new baby or look after their partner during birth) -The chat room was used to discuss breastfeeding and to make announcements. Interpretive Analysis revealed 3 major overlapping themes: <i>lack of social space for new fathers, the complexities involved in balancing work and family life, and fathers' efforts to create a learning space for themselves.</i>
64.	Tellegen & Johnston (2017)	To conduct a service-based evaluation of ' Group Triple P' Parenting Program - delivered as an 8-h all-day group followed by 4 weekly telephone calls.	<i>N</i> = 144 fathers (159 mothers) Age: not specified Child (of fathers): (<i>M</i> = 4.00, <i>SD</i> = 2.42) Country: Australia Design: Repeated-measures pre-intervention post-intervention design	-Significant improvements in child problems, parenting styles, parental adjustment, and parental disagreement were reported -No improvement in parental relationship quality was reported. -High levels of program satisfaction were reported. -A large proportion of the sample (58.3%) failed to complete post-intervention questionnaires.
65.	Thomas et al. (2017)	To examine how pregnancy apps can represent a problematic version / portrayal of performing fatherhood , utilising critical discourse analysis.	<i>n</i> = 665 <i>Google Play</i> apps, <i>n</i> = 1141 <i>Apple Store</i> apps (13 apps: general information / advice about expectant fatherhood; 9 apps: general parenting tips for men; 5 apps: incorporated games; 2 apps: fathering rights; 1 app: exercise tips; 1 app: work-life balance) Age: not specified Child: expecting Country: Australia Design: Review / commentary (critical discourse analysis of app descriptions)	-A minute number of apps were designed specifically for men, compared with those for women -The representation of men in these apps is problematic e.g., the ideal expectant fathers is characterised as requiring information and education in how to support and help his partner and care for an infant. -The apps perpetuate the notion of the modern father (who has to be both supportive and involved, as well as the inept and secondary figure) -The apps examined are suggested by the authors to portray men as only being able to be involved in pregnancy as a supportive partner by engaging with technology. -Both parents are "positioned as deficient in their knowledge of pregnancy and parenting, requiring apps to act as pedagogical agents".
66.	Tully et al. (2017)	To examine practitioner reports of rates of father attendance, barriers to engagement, organisational support for father-inclusive practice, participation in training in father engagement, and competencies in working with fathers.	<i>N</i> = 210 practitioners, both women (<i>n</i> = 158) and men (<i>n</i> = 52), who deliver parenting interventions Age: not specified Children: 2-16 years (**Need to examine results closely) Country: Australia Design: Quantitative Descriptive Survey Data	-Psychologists (39%) and social workers (17.6%) were the most common respondents. -Moderate levels of father attendance (versus low levels) were predicted by greater number of years of practitioner experience, higher levels of competence, and higher levels of organisational support. -The most commonly reported barriers to father engagement noted by practitioners were: fathers' work commitments (81%); fathers not having time (55.2%); fathers' discomfort asking for, or receiving, parenting assistance (53.8%); and fathers feeling that it's a mother's role to parent the child (46.7%).
67.	Wandersman et al. (1980)	To explore the effects of different types of social support (e.g. parenting group, marital instrumental, marital emotional an network) on the adjustment of first time parents in the postpartum period (3 months and 9 months postpartum)	Parenting Group: questionnaires were filled out by fathers (<i>n</i> = 18) and mothers (<i>n</i> = 23). CG: questionnaires were filled out by fathers (<i>n</i> = 24) and mothers (<i>n</i> = 23). Age: 'generally in their mid-twenties' Child: expecting (first-child) Country: USA Design: Longit. quasi-experimental survey	-Results revealed that the importance of a particular type of support may be different for fathers and mothers -Parenting group support and emotional marital support were found to be related to wellbeing, marital interaction, and parental competence for fathers, whereas network support played a statistically significant role for mothers in predicting postpartum adjustment -Contrary to the authors' expectations, membership in the parenting groups did not play a major role in predicting postpartum adjustment.
68.	White et al. (2016)	To use qualitative research and theory to develop the first evidence-based breastfeeding mobile application targeted at men, "Milk Man"	Focus groups (<i>n</i> = 18 fathers, <i>n</i> = 16 health professionals) and prototype testing (<i>n</i> = 4 fathers) Age: 30-40 years (<i>M</i> not specified) Child: expecting or new <6 months Country: Australia Design: Theory-based design and evaluation	-Think-aloud walkthroughs identified 6 areas of functionality and usability to be addressed: including the addition of a tutorial, increased size of text and icons, and greater personalisation. -Testers rated the app highly -The average MARS (Mobile Application Rating Scale) scores for the app was 4.3 out of 5.

Note. IG = Intervention Group; CG = Comparison / Control Group

Appendix C.

Summary of studies incorporating specific interventions / programs which support / educate fathers of new children ($n = 28$)

Study	Intervention	Intervention Design	Outcome(s)	Data collection point(s)	Efficacy of intervention	Comparison	Sample
Abbass-Dick et al. (2017) – Canada – Three-phased pilot study	eHealth breastfeeding resource	eHealth breastfeeding resource targeting fathers and partners as co-parents. Resource developed and piloted in a three-phased study (Phase 1 = needs assessment, Phase 2 = prototype testing with parents, Phase 3 = prototype testing with health care professionals). The eHealth resource provides information in a number of ways including text, video, games, quizzes, and links to additional resources on the internet. The Father/Partner sections included information specific to the role of the father/partner and how co-parents can work together to achieve their breastfeeding goals. Co-parenting topics include: supporting mum, how to work as a team, joint goal setting, fathers' / partners' involvement with their breastfed child, effective communication and problem solving.	Breastfeeding self-efficacy (Breastfeeding Self-Efficacy Short Form); Infant feeding attitude (Iowa Infant Feeding Attitude Scale); Breastfeeding knowledge (Breastfeeding Knowledge Questionnaire); Co-parenting relationship (Co-parenting Relationship Scale)	Time-points: 2 time-points, pre-intervention and post-intervention (questionnaires) Child: expecting or new (≤ 6 months)	Maternal and paternal breastfeeding self-efficacy and knowledge, and infant feeding attitude scores all increased from pre-test to post-test. The eHealth resource may have a positive effect on increasing parents' infant feeding attitudes, breastfeeding self-efficacy, and breastfeeding knowledge. Both parents and health professionals rated the resource highly, with the majority of them indicating it was well organised, innovative and representative of different cultures. Parents indicated they liked the videos and different methods in which the information was provided. Fathers specifically rated the information on 'how they can be involved with their infant' and 'support breastfeeding' highly. The number of fathers in our study who felt the resource was: (a) targeting them (67%) and; (b) that it was an excellent resource (67%), was considered encouraging.	-	$N = 149$ pregnant or new mothers and their partners. Phase I: mothers $n = 16$ and fathers $n = 15$ Phase II: mothers $n = 31$ and fathers $n = 35$ Phase III: public health nurses $n = 29$, childbirth educators $n = 6$, lactation consultants $n = 5$, midwives $n = 4$ and other $n = 10$ and parents from phase II.
Benzie et al. (2015) – Canada – Qualitative analysis of RCT data	Father-Infant Interaction Program (FIIP)	Video-modelled play intervention that aims to increase fathers' sensitivity and responsiveness to infant cues. The intervention is delivered during 1-hr home visits scheduled at the family's convenience. The father is recorded in a structured play task with his infant, and then the video is reviewed in the home and tailored feedback is provided. (Those in the two-visit intervention group receive home visits at ages 4, 6, and 8 months. Those in the four-visit intervention group receive home visits at ages 4, 5, 6, 7, and 8 months)	Positive interaction with infant; Self-esteem; and Reduction of stress (qualitative interviews)	1 time-point: recorded parent-infant interaction (qualitatively) when infant was 8-months-old. Child: Approximately 35 weeks' gestation at birth	Fathers in both the IG and CG liked the convenience of the home visits and validation of their role as a father. Fathers in the IG liked the tailored feedback about play. Fathers recommended tailored, father-oriented programs that incorporate individualized advice and guidance from a professional. Timing of the intervention is important (i.e., 4 months was noted as an appropriate start time, with monthly visits appreciated due to the rapid change in young children)	Fathers in the CG received home visits of a similar length at ages 4 and 8 months	First-time fathers of late pre-term infants $N = 85$, IG (2xvisit): $n = 33$ IG (4xvisit): $n = 18$ CG: $n = 34$
Crumette et al. (1985) – not specified – Pre-test post-test evaluation	Father-Infant Interaction Program (F-IIP)	5-hour structured interactive education program involving 3 learning sessions conducted at a local hospital. (Two group sessions pre-birth and one individual session with father and infant in hospital nursery for 1 x hour duration)	Increased newborn knowledge; Discussion about concerns and feelings; Positive interaction with infant (surveys:	2 time-points: pre-intervention and post-intervention with follow-up 4 weeks post-birth Child: "infant"	Fathers were unanimously positive in their evaluation of F-IIP's content and purpose	-	First-time fathers $N = 11$ (completing Lamaze classes)

			"How Well do you Know the Newborn?" administered pre- and post-test, and the F-IIP checklist post-test)				
Bourget et al. (2017) – Canada – Clinical Project Evaluation	Educational sessions	Educational intervention involving 4 sessions aimed at promoting the development of a sense of mastery in anticipated paternal role. The 4 sessions (first 3 session = 30 minutes each, last session = 90 minutes) are accompanied by complementary booklets regarding: (a) the importance of the paternal role; (b) changes associated with fatherhood; (c) support and understanding the partner; and (d) infant care and needs, as well as active and interactive learning methods (e.g., case studies, games, new fathers' testimonies, small / large group discussion etc.) In Bourget et al.'s study, the program was held in a local community services centre as part of a series of six (2-hour) prenatal classes.	Sense of mastery of anticipated role (i.e., expected behaviours, goals, sentiments etc.) (self-administered questionnaire); Satisfaction with the Content and Format of the intervention (self-administered questionnaire with Likert-scales and open-ended questions)	4 time-points: 3 of the sessions were integrated into the last three prenatal classes of the series of six – the last session was conducted one week after the end of the series of classes. Child: Expecting / pre-birth	Fathers highly appreciated the content and format of the session Fathers were very satisfied with the intervention overall – in preparing them for their paternal role.	-	Expectant fathers N = 6 (attending prenatal classes) n = 3 attended one session, n = 1 attended two, n = 2 attended all four.
Cheng et al. (2003) – USA – Pilot Quantitative survey design evaluating prototypes	Breastfeeding Education program	Two web-based breastfeeding programs – Program A (plain text) and Program B (text with graphics) – developed to provide new parents with necessary information on proper breastfeeding techniques. Participants were recruited from classes held for expectant parents planning to deliver at the University of Utah Hospital.	Satisfaction with educational program (QUIS)	3 time points: participants completed questionnaires after viewing each program (A then B) and then a Final Evaluation Child: 1 week post post-birth	Results do not distinguish between responses from mothers and those from fathers. Overall, the computer was viewed as a valuable learning tool. The program with the graphics was preferred over the text-only programs. Subjects who viewed the text-only version first tended to give it a higher score than the people who viewed the graphics version first. Viewing time of the program was approximately 30-40 minutes, and this was deemed appropriate by study participants.	-	Expectant parents N = 20 (60% female, 40% male) (Assignment to either Program A or Program B was random)
Danbjørg et al. (2015) – Denmark – Intervention followed by qualitative interview	Telemedicine (mobile app)	Telemedicine provided via a mobile phone app for parents following early discharge from hospital. The app includes features such as asynchronous (i.e., online chat) communication (where parents can send videos and photos to healthcare professionals), informational material with a search function, and messages issued automatically every 12 hours (relating to breastfeeding, baby's first bowel movements etc.).	Parental self-efficacy (theory-driven semi-structured interviews); A sense of security (theory-driven semi-structured interviews); If postnatal needs	28 interviews were conducted. (Parents were interviewed together in 10 cases, but only 1 father was interviewed alone) Child: Immediately post-birth	Parents were confident in the use of the app. Parents did not experience any barriers in contacting the nurses via asynchronous communication and did not feel like they were disturbing any staff (a common concern of parents generally). Parents felt that their follow-up support needs were met by use of the app. Parents viewed the app as a 'lifeline'. The app shows potential for enhancing self-efficacy and postnatal sense of security.	-	New parents N = 38 (11 fathers and 27 mothers) (couple-based)

		Parents have access to the app for 7 days post-discharge.	are met (interviews)				
Diemer (1997) – USA – Quasi-experimental pre-test post-test evaluation	Perinatal / antenatal classes	8-week childbirth education class, which has the same content as the CG but uses a group discussion format that aims to facilitate peer support and increase fathers' social network support and coping skills, to decrease perceived stress. Weekly assignments are given with the aim to increase expectant fathers' involvement	Stress (BSI), Coping strategies (CMS), Social network (SNSS), Supportive spousal behaviours (SBQ), couple conflict behaviour (CTS)	2 time points: Pre-intervention and post-intervention Child: Antenatal period from the third trimester of pregnancy	Mixed results were found. Intervention effect was found in the use of reasoning during conflicts and housework activity among fathers in the IG, but no intervention effect was found in overall coping responses in the IG	Couples attended 8-week traditional childbirth classes with information on prenatal care, labour, delivery, postpartum care, breathing and relaxing, and newborn care and feeding provided	Expectant fathers $N = 83$ IG: $n = 43$ CG: $n = 40$
Fletcher, Hammond et al. (2017) – Australia – Feasibility qualitative study / participatory design	<i>Stayin' On Track</i>	An adaptation of <i>SMS4Dads</i> - a mobile phone-optimised, SMS-based informative and interactive telephone-linked support system for new fathers – for use with young Aboriginal fathers. Text message topics address the father-infant bond, fathers' support of their partner, co-parenting, and fathers' self-care. For this project, the texts were reviewed and modified by two Aboriginal mentors to include e.g., 'if your baby could talk he / she would say, 'I like your big strong hands holding me'. The program also includes a Mood Tracker.	Study: Acceptability, feasibility and sustainability of intervention ('yarn up' sessions, testing text message prototypes, community feedback, and website dissemination to enhance knowledge, learn the value of sharing concerns, and feel empowered as mentors)	Time-point: 1 time-point spanning 4 weeks (text messages); 4 to 6 weeks (Mood Tracker) Child: "young" (at least one)	Evaluation feedback was overwhelmingly positive. The development of the culturally appropriate web-resource reinforced community pride. Internet- and mobile phone-based resources developed in close partnership with the Aboriginal community offer viable, acceptable and sustainable support mechanisms for young Aboriginal fathers. Young fathers saw great value in networking with other fathers and began to view themselves as mentors and role models within the community.	-	$N = 20$ young Aboriginal fathers (co-investigators for project)
Fletcher, May et al. (2017) – Australia – Pilot study of uptake, user engagement & acceptability	<i>SMS4dads</i>	Mobile phone-optimised, SMS-based, informative and interactive telephone-linked support system for new fathers. Intervention consists of two components: 27 text messages, and weekly Mood Tracker interactive texts (option for telephone assistance). Messages are tailored to antenatal or postnatal contexts, as relevant.	Uptake; User engagement; and Acceptability of intervention (fathers' use of embedded website links, fathers' responses to Mood Tracker, and	2 time-points: (baseline measurements of distress taken, post-intervention structured phone interviews ($n = 19$) / with Likert-scale questionnaires).	Tentative support found for the use of mobile phone technology. All interviewed fathers stated they would highly recommend <i>SMS4Dads</i> to new fathers. Most frequently clicked embedded website links were 'Becoming a dad: a big adjustment' (22%), and 'Talking to your baby' (14%). Least frequently clicked links regarded 'Services and support', 'Your baby is reading your face', and 'Dads' mental illness'. Over half	-	New or expectant fathers $N = 40$

			recruitment rates); Psychological distress (Kessler K6)	Child: expecting child within 6 months or infant is <3 years.	of the interviewed fathers (58%) commented favourably on the Mood Tracker – but one participant reported it was “too frequent”. Concerning levels of psychological distress may have been detected in several participants via measures of distress and the mood tracker.		
Fletcher et al. (2016) – Australia – Three-phased pilot study assessing feasibility / acceptability	<i>SMS4Dads</i>	Short Message Service (SMS) messages designed to support fathers of infants aged ≤12 months	Feasibility and Acceptability of intervention (paper-based surveys and telephone interviews)	3 time-points: Phase I (practitioners sent developed draft text messages, which were then sent on to a panel of expert reviews), Phase II (mothers and fathers evaluated text messages and provided feedback), Phase III (these fathers consented to participate in a phone interview and demographic surveys.	SMS items were easily understood by majority of the parents (97%) Negatively rated SMS messages were considered as either poorly phrased, lacking enough information, or as not offering sufficient support. Receiving the tests at different times was acceptable to fathers and the message content was relevant to their fathering.	-	P1: n = 6 experienced practitioners, n = 15 expert reviews P2: n = 56 mothers and n = 46 fathers P3: n = 21 fathers, n = 15 interviewed by phone, n = 106 parents (demographic survey)
Fletcher & May (2016)	<i>SMS4Dads</i>	See above.	Report.	-	-	-	-
Grant et al. (2001) – Mixed methods program evaluation	<i>FatherWork</i> (web-based intervention)	A web-based intervention which uses real-life stories or narratives to motivate and provide high quality education to fathers – through a medium that can reach millions.	Educational Effectiveness (unclear)	Time-point: 1 time-point (fathers' accessing the World Wide Web) Child: not specified	Many users visit the site in the late afternoon on weekdays Most popular educational modules were: Fathering Across the Life Span, Fathering Teenagers and modules on infancy and the toddler years. (NB., despite the lack of demographic details, most of the feedback comments include whether a mother or father was responding)	-	**Demographics are not given for the current study, but basic demographic information on World Wide Web Users is provided generally. (34% of users are aged 35-44 years and 61% are male)
Gross et al. (1995) – not specified – Randomized control group study with pre-test post-test measures (lacks clarity to be classified an RCT)	Parent Training Program	10-week program that focuses on assisting parents to effectively interact with their toddlers. Parents are videotaped playing with their toddlers. During each session, participants watch and discuss a series of videotaped vignettes of parent-child models, engaged in typical family situations. Parents were recruited from an urban medical centre HMO and its surrounding community. The sessions were led by two group leaders who had a master's degree in psychiatric nursing The IG received 1 of 2 x 10-week sessions.	Parenting self-efficacy (TCQ); Depression (CESD); Stress (PSI) and Perception of toddlers' behaviours (ECBI; TTS) Observed parent-toddler interaction (DPICS); Parent satisfaction with intervention (instrument by	3 time-points: pre-intervention, post-interventions and 3 months follow-up Child: 2 years old	Intervention group fathers did not demonstrate significant improvements. 40% of the fathers attended fewer than half the sessions and 50% completed none of the assignments. Fathers rated their children's behaviour much less problematic than did mothers at each assessment point.	CG did not receive parent training program (i.e., one of two sessions)	N= 48 mothers, fathers and toddlers with behavioural difficulty IG: 10 mothers, 10 fathers, 11 toddlers CG: 6 mothers, 6 fathers and 6 toddlers Drop out group: 7 mothers, 7 fathers, 7 toddlers (selected after randomization)

			Webster-Stratton, 1990)				
Hudson et al. (2003) – USA – Quasi-experimental repeated measures pilot study	<i>New Fathers Network</i>	Internet-based intervention that contains an online library of information, discussion forums and electronic mail access to advance practice nurses (APNs) – to improve first-time fathers' parenting self-efficacy and parenting satisfaction during the transition to parenthood. The interactive element of the intervention involved the possibility for fathers to contact APNs via e-mail with questions about infant care and health, infant growth and development, and concerns about the fatherhood role. (Intervention = 20 mins / week for 4 weeks). Fathers were recruited from hospital following discharge of mothers and infants.	Parenting self-efficacy (ICS) and Satisfaction (WPBL-R); Satisfaction with intervention (telephone interviews)	2 time-points: First home-visit 4 weeks post-birth (Both IG and CG); second home-visit at 8 weeks following infants' birth Child: 4 - 8 weeks postpartum	Participants were primarily satisfied with the intervention (fathers indicated it was easy to navigate, easy to find topics of interest and that the library was organised). Fathers valued their opportunity to participate in an asynchronous discussion group with other fathers. Fathers in the Intervention group expressed their desire to continue discussion with other fathers for longer than 1 month. Parenting self-efficacy and satisfaction scores of the IG significantly improved from 4 to 8 weeks, but did not for the CG.	Fathers in the CG were part of a larger study of factors influencing the transition to parenthood and were recruited prior to their partners' ninth month of pregnancy.	First-time fathers N = 34 IG: n = 14 CG: n = 14 (**not randomized)
Hurwitz et al. (2015) – USA – Quasi-experimental semi-randomized evaluation study	<i>Parent University</i>	Text-messaging intervention delivery parenting tips to parents of children enrolled in <i>Head Start</i> programs, prompting them to engage in more learning activities with their children. Text messages were sent each day (Monday – Friday) between 5 and 6pm and were automated push messages – each week the messages had a theme (e.g., literacy, mathematics and science)	Parent-child activities / positive child outcomes (questionnaire); Experience with service (questionnaire with Likert scales)	2 time-points: intervention and 6 month follow-up (questionnaire) and IG continued texting service for the remainder of the 52 weeks Child: 6 months to 5 years (M = 3.40, SD = 1.22)	Parents who received the service engaged in more learning activities – this was particularly true of fathers and parents of boys. Parents reported high rates of satisfaction with service and liked the idea of incorporating cell phones into parenting interventions. Most (74%) indicated that text messages are a good way to receive parenting information. Mothers' and fathers' attitudes towards and use of Parent University were fairly similar.	CG did not receive text service, however were given the option to sign up for the service free of charge for one year.	N = 253 (76% mothers, 16% fathers, 8% grandparents, nannies etc.) IG: n = 119 CG: n = 134 (not randomized)
Lawrence et al. (2012) – UK – Qualitative feasibility study	<i>Video-feedback Intervention to promote Positive Parenting (VIPP)</i>	Video-feedback intervention, which incorporates social learning and attachment perspectives to engage and work with fathers in an attempt to improve their parenting capacities and thereby improve their children's outcomes. N.B., VIPP and its adaptations have been thoroughly evaluated in five RCTs. A number of key features make it suitable for fathers: it is brief, home-based, focuses on positive aspects of interaction, and focuses directly on interaction through use of "mirror-like" video feedback with individual tailoring. VIPP involves 4 x sessions. Sessions take place in the evenings or weekends – all five fathers in this study had sessions at home, with one father having one session at work.	Feasibility of intervention (i.e., acceptability and deliverability - detailed feedback via a self-completion questionnaire with five-point Likert scales); Parenting capacities (i.e., fathers' sensitivity and responsiveness in their infant interactions); Father's engagement (19-item questionnaire);	2 time-points: pre- and post-intervention Child: 6 months at first session, to 15 months	Fathers rated the intervention as having had a significant impact on their understanding of their child's thoughts and feelings. The intervention improved their communication and relationship with their baby. Flexibility to conduct sessions at home (or at fathers' places of work) and flexible timing of sessions were identified as fundamental to successful delivery. Both depression scores and fathers' ratings of their infants' difficult temperament reduced slightly after treatment.	-	Fathers with new young children N = 5 (recruited from existing longitudinal study)

			Paternal mood (EPDS), Infant temperament (ICQ)				
Lee & Walsh (2015) – not specified - Descriptive case study / mixed methods	<i>mDad (Mobile Device Assisted Dad)</i>	Smartphone app to providing a father-friendly tool to help new fathers learn about and engage with their infants and toddlers. The intervention sends push notifications to users' smartphones two times / week – containing information on infants, toddlers and developmental milestones. Creating logs, uploading pictures and videos used to document development. The app uses father-friendly "buddy language" and tailored information to target age of child.	Acceptability and usability of intervention with military fathers and beta users (qualitative one-on-one interviews and focus groups)	Time-points: Usability and acceptability of mDad assessed with fathers who used the app for 8 weeks. Child: newborns - 32 years of age	Across both military and beta participants, <i>mDad</i> was rated highly as interesting and relevant to fathers. Both users liked the function allowing one to track developmental milestones, as well as brief, succinct and specific messages. Tailoring was well received by beta users as well as the educational, humorous tone. Participants felt the app would be most useful for first-time fathers, but also for more experienced.	-	Usability of <i>mDad</i> (<i>n</i> = 4 men); Acceptability of <i>mDad</i> military fathers (<i>n</i> = 9 military fathers, child: ≤3 years); Acceptability and Usability with <i>mDad</i> Beta Users (<i>n</i> = 4 beta users with various military experience, child: 'young')
Lindberg et al. (2009) – Sweden – Mixed Methods Pilot study	Videoconferencing	Videoconferencing as a communicative device between parents, discharged early from the maternity unit, with midwives from the hospital (as opposed to telephone calls). The intervention includes sounds and pictures and communication with midwives on a round-the-clock basis, during the first week after the birth (NB., parents still had access to home visits and the ordinary, national child health-care programme)	Parents' experiences of VC (semi-structured interview)	Time-point: intervention lasted for 1 week post-birth (questionnaires were administered in every contact with the midwife); and follow-up post-intervention at 6 weeks post-birth (interviews) Child: 72 hours post-birth up to 1 week old	Parents felt generally confident using the VC equipment and enjoyed being pilot tests for new technology. Most parents felt no threat to their privacy but some were uneasy of Internet hackers. Fathers felt that meeting the midwife via VC was less invasive of privacy than a home-visit. Some fathers felt that the VC meeting was superficial.	-	New parents <i>N</i> = 9 (couples)
Mackert et al. (2017) – USA – Mixed methods pilot evaluation study	e-health application	e-health application to educate men about pregnancy-related health. The app is built with a responsive website design approach (content is optimally shown and not platform specific), employs a card layout, incorporates sufficient use of white space, consistent headings, relevant visuals to reinforce text and plain language wherever possible. Participants spend 5 to 7 minutes navigating the e-health application on a tablet computer and their navigation was tracked by a screen recording device. Specifically participants navigates through 2 slideshows that detailed week-by-week foetal development (one used fruit and vegetables as analogies for foetal growth – the other used sports objects)	Men's prenatal health; fathers' preferences for content of app (semi-structured interviews, surveys, observational prototype testing and open-ended questions)	Time-point: 5 to 7 minutes navigating e-health application followed by open-ended questions relating to content, followed by 12-item survey about prenatal health and future use (7-point Likert scale) Child: expecting	Barriers to involvement were identified as: time and availability concerns (misconception that prenatal classes are only available during the work week at inconvenient times), and feeling a physical 'disconnect'. Fathers rated the application as: useful and interesting information, 'engaging' and enjoyed the use of graphics. For visual foetal development metaphors, the majority of participants preferred fruits and vegetables images (61%), over sports-themed images (39%). Participant recommendations included: adding videos and interactive modules to make the application stronger, being able to input personal information and personalise the experience (i.e., font size and colour). While the app was rates as having "just the right amount of information," adding external links to reputable health care websites or drop-down content for further reading was suggested.	-	<i>N</i> = 23 fathers

<p>Plannenstiel et al. (1991) – USA – Randomized control group pilot study with pre-test post-test measures (lacks clarity to classify RCT)</p>	<p><i>Information and Insights about Infants (III)</i></p>	<p>Prenatal intervention for low socio-economic, first-time fathers whose partners were experiencing a high- or low-risk pregnancy. The intervention program is designed to acquaint fathers-to-be with information, insights, and clinically appropriate techniques in responsive care of infants. These fathers received 2 intensive 1 ½ hour sessions (2 x teaching and modelling sessions). The sessions incorporated a life-size doll for which the following nurturing behaviours were demonstrated: stimulating to feed without intrusiveness, burping style with gentle pats, postural holding, talking to an infant etc.)</p>	<p>Effectiveness of intervention (questionnaires and demographic interviews)</p>	<p>3 time-points: Antepartum (2nd month of pregnancy: recruitment, initial interview, pretesting plus intervention program for treatment group only); Intrapartum/ Time 1 (birth through to day of hospital discharge: filming every father while they bottle feed their infant in the hospital setting); and Postpartum / Time 2 (1 month later: filming every father again while they bottle feed their infant) Child: Birth – 1 month</p>	<p>In the hospital setting, those in the IG who received a brief intervention prenatally, were able to hold, feed, and respond to their newborn infants in a more tuned-in, tender, and responsive manner than CG fathers who had not experienced the 3 hours of the information support program. These results held up marginally for 1 month after hospital discharge. Furthermore, those in the low-risk pregnancy group intervention had higher summed scores than fathers in the high-risk pregnancy group with intervention. CG fathers had significantly higher scores than IG fathers on two items: modulation of distress by noticing subtle cues and intervening to prevent crying; and ceasing to feed when infant seemed satiated rather than continuing to try to feed.</p>	<p>CG fathers were not seen again until Time 2 (in-hospital filming of father-infant feeding episodes) where they received the booklet on “Where Are the Fathers?” (designed to highlight the content of the IG program) at Time 2 in-home</p>	<p>First time fathers: N = 67 IG: n = 11 (pre-post test “high-risk”), n = 11 (Pre-Post test “low-risk”), n = 12 (Posttest only “low risk”) CG: n = 11 (pre-post test “high-risk”), n = 11 (Pre-post test “low-risk”), n = 11 (Posttest only “low risk”)</p>
<p>Pilkington et al (2017) – Australia – Qualitative usability testing</p>	<p><i>Partners to Parents</i></p>	<p>Online website intervention for preventing perinatal depression and anxiety, focused on enhancing partner support (based on the premise that it is a protective factor). Incorporates clear and uncluttered text, pictures, no advertisements, and information on how to seek help. Is free and accessible. No online or offline support is offered – instead hyperlinks for additional support / resources are available. Topics covered include: preparing for parenthood, communication, sexual satisfaction, emotional closeness / support, support from partner / family / friends, managing conflict, self-care, mood (i.e., depression etc.), and help (i.e., seeking professional assistance). The website excludes topics on infant crying and parent-infant attachment.</p>	<p>Perceptions of usability (i.e., ease of use, acceptability and relevance) of website (Measured by 30 minute testing session, cognitive walk-through and open ended questions regarding areas of improvement, and potential barriers)</p>	<p>Time-point: website accessed during perinatal period Child: expecting or ≤24 months</p>	<p>System quality was rated positively and related to the personalisation of the website. Negative comments about system quality regarded navigability and layout. Content quality was rated highly based on the usefulness of the information. This was particularly the case for fathers. Suggestions for improvement included: improved navigability, simplification of content to improve readability, the inclusion of ‘real-life’ examples, and quizzes and interactive elements. Potential barriers to using the website was not being aware of its existence or it being difficult to find through search engines such as Google. Potential deterrents to accessing the intervention were if there was a better rival website, lack of time, access to the website requiring an email log-in, and if the website included advertisements.</p>	<p>-</p>	<p>N = 12 Fathers expecting or parenting first or second child n = 5 (n = 7 mothers)</p>
<p>Price (2001) - USA – Commentary and evaluation of intervention</p>	<p>Dad’s Evening</p>	<p>Postnatal dad’s evening exploring the role and expectations of fathers in today’s society to identify emerging health needs. Provides an environment which encourages men to talk about their experiences of parenthood and challenges conservative masculinity. Facilitates the formation of friendships between new</p>	<p>Encourage social support (discussion); Promote male health (educational content); Explore ideas about fatherhood</p>	<p>Time-point: one-off sessions over a nine-month period. Child: 4-12 weeks of age</p>	<p>The time and venue of sessions (8pm week night) were deemed suitable and convenient. All fathers indicated they would recommend the group to other new fathers. Fathers came to the evening to: ‘meet other fathers’, ‘partner’, and ‘baby resuscitation’. The latter was cited as the most useful part of the evening followed by ‘getting to know other dads’. Men’s health was the least useful part of the evening for the</p>	<p>-</p>	<p>First time fathers N = 46</p>

		fathers within the local community, thereby prompting support networks. This particular session commenced at 8pm and was planned to last for two hours. The content regards father's experiences, infant resuscitation, testicular cancer and self-examination with short videos			majority of men. Areas of improvement suggested: increasing no. of evenings, increasing the amount of unstructured talking time, more information on infant illness, advice about childcare / schooling, information about prostate cancer, and the effects of a difficult birth.		
Self-Brown et al. (2015) – USA – Descriptive study of pilot data from program	<i>Dad2K</i>	Positive Parenting skills program involving computer software and home visits utilised to target positive parenting skills and the prevention of child neglect and physical abuse. The content of <i>Dad2K</i> is based on the 'SafeCare' PCI module using a sports-themed approach (i.e., teaching fathers 10 Planned Activities Training [PAT] skills to prevent challenging behaviour, how to structure daily routines and tools to enhance positive interaction with child). The software provides motivational content, psychoeducation and video modelling of PAT skills at each session (6 sessions)	Parent skills (cPat); Parent Satisfaction (10-item survey with 5-point Likert scale); and Perceptions and Satisfaction with program (semi-structured interviews) to determine the feasibility, acceptability and impact of intervention (in order to inform a randomized-controlled trial)	Time-point: 6 sessions Child: 18 months – 5 years	Fathers were on average, satisfied to very satisfied, with the program, particularly the technology-assisted components of the intervention. A hybrid approach (i.e., using technology and a provider) was found to be a feasible way to engage fathers in a behavioural parent training program	-	N = 4 African American 'at-risk' fathers (either young, low-income, low-educated, single parent)
Shorey, Lau et al. (2017) – Singapore – Two group randomized controlled trial (RCT) with pre-test post-test measures	<i>Home-but not Alone</i>	Psychoeducation programme delivered via an app with the aim of improving on parental outcomes (Program on top of routine care). The app features a database on role-specific educational contents, periodic push notifications to give timely information and asynchronous communication with healthcare professionals. The content includes PDF files, videos and audio files.	Parental Self-Efficacy (Parenting Efficacy Scale); Social support (4-item Perceived Social Support for Parenting scale); Postnatal Depression (10-item Edinburgh PND Scale); and Parenting Satisfaction (11-item satisfaction subscale of What Being the Parent of New Baby is Like scale)	Time-point: 2 time-points: pre-test at baseline *before mothers were discharged from hospital) and post-test (at the end of 4 weeks using the app) Child: new to 4 months postpartum	IG demonstrated statistically significant improvements for parental self-efficacy, social support and parenting satisfaction at 4 weeks postpartum compared with the CG. Postnatal depression scores did not show any significant improvement compared with the CG. Asynchronous communication between midwives and parents provided a form of verbal persuasion to parents, which in turn increased their decision-making and self-efficacy. Participants reported they were satisfied with the program.	Participants in CG received routine care in hospital (i.e., educational support from nurses / midwives re. maternal and infant care, plus an appointment with doctors between 10 days to 6 weeks postpartum.	First-time parents and parents of a child / children before, IG: n = 126 CG: n = 124
Shorey, Yang, & Dennis (2018) – Singapore –	<i>Home-but not Alone</i>	See above.	Views of parents regarding content, mode of delivery and effectiveness	Time-point: 4 weeks Child: new to 4 months postpartum	(1) Parents rated the app as a good informational resource, catering to the local context and new-generation parents. Information was tailored to	-	N = 17 participants who belonged to the intervention group of a RCT.

Descriptive qualitative study of RCT IG group			of intervention (semi-structure face-to-face interviews of 30-40 minutes)		individualised needs, was easy to access and allowed the recap of information. (2) Advices from midwives was considered by parents as reliable, reassuring, prompt and a facilitator for the decision-making process regarding care of their baby. (3) Using the app results in increased confidence and satisfaction of taking care of their baby. The app felt like a support mechanism between doctor's follow-up sessions and was like 'a friend during the transition phase, and hearing other parents' experiences helped to put things 'in perspective' (4) Couples suggested that the duration of support needs to be extended, usability of the app needs to be promoted and additional education topics added (e.g., how fathers can support their wives / how to deal with older siblings and babies) as many parents felt the app was geared towards first-time parents only		(5 couples – fathers (n = 4) and mothers (n = 3))
Tellegen & Johnston (2017) – Australia – Retrospective service-based evaluation, repeated measures design	<i>All-Day Group Triple P</i>	Parenting Program designed to improve outcomes for both children and parents. Current study is a service-based evaluation of the reduced Group Triple P program (University of Queensland). The program is delivered as an 8 h all-day session on a Saturday, followed by 4 weekly telephone calls (conducted individually, 15-20 minutes duration). Each parent receives a workbooks with activities complementary to the discussion and training run by the practitioner. Topics covered include: factors influencing children's behaviour, ideas for keeping track, strategies to develop a positive parent-child relationship, encourage desirable behaviour, teaching new skills and behaviours, and managing misbehaviour.	Child problems (ECBI); Parenting styles (PS); Parental adjustment (DASS); Parental disagreement (PPC); Parental relationship quality (RQI); Client satisfaction (CSQ)	2 time-points: pre-intervention and post-intervention Child: average age of 4.08 (SD = 2.43)	Significant improvements in child problems, parenting styles, parental adjustment, and parental disagreement were reported. No improvement in parental relationship quality was reported. High levels of program satisfaction were reported. A large proportion of the sample (58.3%) failed to complete post-intervention questionnaires.	-	N = 144 fathers (159 mothers)
White et al. (2018) – Australia – Qualitative analysis of forum posts	<i>MilkMan</i>	Evidence-based breastfeeding mobile app targeted at men, containing an online forum and a library of information for fathers. Designed to assist in facilitating discussion among fathers regarding breastfeeding, with an aim to increase the support they offer to their breastfeeding partners. Timely topics regarding infant milestones and community building. New	Fathers' engagement with forum of app	Time-point: 1 = perinatal period (antenatal sign up – 26 weeks postpartum) Child: expecting – 26 weeks of age	Fathers are prepared to use such a forum The forum was used in a variety of ways: to seek and offer support, to share experiences, to build connection, and to offer informational support. Some fathers used the app to share very personal information, e.g. a miscarriage / resuming intimacy with their partner, while others used it as a means of 'joining in'.	-	N = 208 forum contributors (fathers) n = 187 fathers (with demographic details)

		content is added to the app twice a week, coinciding with push notifications. Participants of present study were recruited through maternity hospitals in WA.			Posting in the forum was concentrated in the antenatal period and up to approximately 6 weeks postpartum.		
White et al. (2016) – Australia – Qualitative development and prototype testing	<i>Milk Man</i>	The first evidence-based breastfeeding mobile application targeted at men. (See above for details). The current study used qualitative research and theory to develop <i>Milk Man</i> .	Functionality and usability of app. (Qualitative focus groups, consulting health professionals, beta / user prototype testing, think-aloud walk-through, and MARS)	Time-point: 3 stages (formative research, testing, and iteration) Child: expecting or new <6 months	Think-aloud walkthroughs identified 6 areas of functionality and usability to be addressed: including the addition of a tutorial, increased size of text and icons, and greater personalisation. Testers rated the app highly. The average MARS (Mobile Application Rating Scale) scores for the app was 4.3 out of 5.	-	New and expectant fathers $n = 18$, plus health care professionals $n = 16$ ($n = 4$ fathers tested prototypes)

Note. QUIS = Questionnaire for User Interaction Satisfaction; TCQ = Toddler Care Questionnaire; ECBIT / ECBI = Eyberg Child Behaviour Inventory; TTS = Toddler Temperament Scale; CESD = Center for Epidemiologic Studies Depression Scale; PSI = Parenting Stress Index; DPICS = Dyadic Parent-Child Interaction Coding System; ICS = Infant Care Survey; WPBL-R = What Being the Parent of a New Baby is Like-Revised; EPDS = Edinburgh Postnatal Depression Scale; ICQ = The Infant Characteristics Questionnaire; cPat = SafeCare Child Planned Activities Training Home Visitor Assessment for m; PS = The Parenting Scale; DASS = The Depression Anxiety Stress Scale; PPC = The Parenting Problem Checklist; RQI = The Relationship Quality Index; CSQ = The Client Satisfaction Questionnaire; MARS = Mobile Applications Rating Scale
Note. IG = Intervention Group; CG = Comparison Group