



Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/ijns

Parent-targeted postnatal educational interventions in low and middle-income countries: A scoping review and critical analysis



Justine Dol^{a,d,*}, Marsha Campbell-Yeo^{a,b,c,d}, Gail Tomblin Murphy^{b,d}, Megan Aston^{b,d}, Douglas McMillan^c, Jacqueline Gahagan^e, Brianna Richardson^b

^a Faculty of Health, Dalhousie University, 6299 South St., Halifax, NS, 902-470-2638, Canada

^b School of Nursing, Faculty of Health, Dalhousie University, 6299 South St., Halifax, NS, Canada

^c Division of Neonatal Perinatal Medicine, Department of Pediatrics, Faculty of Medicine, Dalhousie University and IWK Health Centre, 6299 South St., Halifax, NS, Canada

^d World Health Organization/Pan American Health Organization (WHO/PAHO) Collaborating Centre on Health Workforce Planning and Research, 6299 South St., Halifax, NS, Dalhousie University, Canada

^e School of Health and Human Performance, Faculty of Health, 6299 South St., Halifax, NS, Dalhousie University, Canada

ARTICLE INFO

Article history:

Received 26 April 2018

Received in revised form 10 March 2019

Accepted 12 March 2019

Keywords:

Newborn

Postnatal care

Parents

Education

Developing countries

Scoping review

ABSTRACT

Objectives: To identify and map existing postnatal educational interventions targeting parents in low and middle-income countries. A secondary objective is to conduct a critical analysis of the strengths and limitations of the educational strategies used for parent-targeted postnatal education.

Design & data sources: Using scoping review methodology, MedLine, CINAHL, and SCOPUS were searched in October 2017.

Review methods: All studies published after 2000 reporting on educational interventions that targeted parents from the period of birth to 6 weeks postnatally in low and middle-income countries were included. Studies were excluded if they targeted healthcare professionals or were community interventions that spanned antenatal to postnatal care. Title, abstract and full-text screening was conducted by two reviewers.

Results: We initially identified 9284 articles with 77 articles included after title, abstract and full-text screening. Most of the studies were quantitative (94%) with over half published after 2014. Most studies (61%) targeted a single newborn care education intervention, of which 75% targeted breastfeeding. Interventions used on average three different methods of implementation (e.g., verbal, written information, counselling). Interventions were provided in the hospital (76%), at home (23%), at a clinic/hospital (8%), and/or virtually through an eHealth intervention, including phone or text messages (12%). Maternal outcomes primarily included knowledge, self-efficacy, anxiety and stress while newborn outcomes primarily included exclusive breastfeeding, weight gain at follow-up, and morbidities. Positive changes were found to occur for reported maternal outcomes (89%) and newborn outcomes (56%).

Conclusions: Parent-targeted education varied in terms of educational topics covered, method and location of intervention, and outcomes examined. While the best strategies of implementing postnatal education interventions to parents in low and middle-income countries is yet to be determined, evidence suggests that current interventions had a positive impact on parents' outcomes using a combined approach. Further work is needed to evaluate the impact on newborn outcomes and to identify the most effective methods and timing of the interventions.

© 2019 Elsevier Ltd. All rights reserved.

* Corresponding author at: Faculty of Health, Dalhousie University, 6299 South St., Halifax, NS, 902-470-2638, Canada.

E-mail address: Justine.dol@dal.ca (J. Dol).

What is already known about the topic?

- Many mothers and newborns in low and middle-income countries do not receive sufficient postnatal care after birth, including advice related to providing care at home and when/how to access additional care when necessary

- Targeted education to parents during the postnatal period can help increase knowledge and confidence in caring for their newborns at home, with care provided by families reducing newborn mortality by 10–50% through hygienic umbilical cord care, breastfeeding, and appropriate thermal care

What this paper adds

- Current postnatal educational interventions were considerably varied in terms of topics covered, methods used, location of intervention, and outcomes examined.
- Evidence suggests that current parent-targeted postnatal education interventions had a positive impact on parents' outcomes but report mixed findings on newborn outcomes
- There is a need for increased standardization in terms of both content of postnatal education as well as outcome measurements and time points to be able to compare effectiveness across interventions

1. Introduction

Despite global goals to improve maternal, newborn and child health outcomes, newborn mortality continues to be a concern, particularly in low and middle-income countries (Shetty, 2016). The postnatal period, defined as the first six weeks of life, is particularly critical for newborns and mothers, with 2.6 million newborns dying worldwide each year within their first month after birth (Sines et al., 2007; United Nations, 2017). In 2017, the United Nations released a report on child mortality, stating that death in the first 28 days remains unacceptably high at a rate of 19 out of 1000 births (United Nations, 2017). Moreover, most newborn deaths in low and middle-income countries during this period occur at home, regardless if the mother gave birth at a health facility or had a skilled birth attendant present at birth (2017, Sines et al., 2007). The postnatal period is critical as 46% of all under-5 deaths occur within the first month of life (United Nations, 2017; World Health Organization, 2013).

Current World Health Organization (WHO) (2013) postnatal guidelines recommend that mothers and newborns receive postnatal care for the first 24 h after birth at a health facility or within 24 h if birth was at home, followed by a minimum of three postnatal visits occurring within 48–72 h, between days 7–14, and six weeks post birth. However, most mothers and newborns in low and middle-income countries do not have the suggested number of postnatal visits, with only 58% of mothers having a postnatal visit within two days after birth (World Health Organization, 2014a). Challenges remain with the implementation of effective newborn interventions due to poor and uneven availability of healthcare workers in many low and middle-income countries related to workforce shortages, finances allocated to health services, and health service delivery at the facility level (Dickson et al., 2014; Shetty, 2016). Given these challenges, innovative strategies must be utilized to improve newborn care during this critical period.

One opportunity that warrants further attention is the education of parents and other family members with knowledge and skills for the provision of newborn care at home. While there are some postnatal interventions that need to be provided by skilled healthcare workers such as immunization and the treatment of newborn infections, family members are essential in the provision of ongoing care (i.e., breastfeeding, skin-to-skin contact, preventing infections) and ensuring survival (i.e., assessing for danger signs, seeking professional help when required, obtaining immunizations) (WHO, 2014a,b). In low and middle-income countries, care provided by families has been found to

reduce newborn mortality by 10–50% through hygienic umbilical cord care, breastfeeding, and appropriate thermal care, such as skin-to-skin contact (Darmstadt et al., 2005). Despite the potential positive impact of parent-led care on newborn outcomes, there has been limited synthesis of educational strategies and interventions targeting parents during the postnatal period and its impact on maternal and newborn outcomes in low and middle-income countries.

Parent-targeted postnatal educational interventions are defined as structured forms of education provided to parents and is theorized to enhance parenting behaviours through the development of knowledge related to caregiving and increasing parent's skills, confidence, and competence in caring for their newborn (Bryanton et al., 2013). Throughout this review, the terms “parents” is broadly used to refer to both mothers and/or fathers (biological or non-biological) as well as other family caregivers (e.g., grandparents) who are providing direct care to the newborn, in keeping with the language used in the interventions included in this scoping review. While many interventions targeting postnatal care included in this review focused solely or predominantly on the biological mothers and their newborn, by using the term parents, we have included interventions targeting primary caregivers during this period. To address newborn mortality, parent-targeted educational interventions can occur any time from conception through the postnatal period. Antenatal education, occurring between conception and birth, tends to target health behaviours related to pregnancy and childbirth to help future parents understand their own needs and ensure safe childbirth (Gagnon and Sandall, 2007; Shetty, 2016). Due to the focus of antenatal education, targeting parent education for newborn care during the postnatal period may be more appropriate and responsive to parents' needs at that time. To date, there is a paucity of synthesized literature on parent-targeted postnatal educational interventions in low and middle-income countries in terms of timing, method of delivery, content, and its impact on maternal and newborn outcomes.

2. Methods

Scoping review methodologies offer a structured means of exploring and mapping an understudied body of work in the existing literature while identifying current gaps (Arksey and O'Malley, 2005; Levac et al., 2010). In line with Arksey and O'Malley's (2005) approach to scoping reviews, the current scoping review sought to explore and map an understudied body of work and to explore the range of research in the area while identifying current gaps. This review used the original five steps of scoping review methodology as outlined by Arksey and O'Malley: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing, and reporting the results (Arksey and O'Malley, 2005). Arksey and O'Malley (2005) also include an optional sixth step of a consultation exercise to validate the findings, but due to the nature of this review, the first five steps were prioritized. Levac et al. (2010) builds on the original scoping review methodology to provide additional recommendations at each step, which were considered in this review, including the need for analysis of the results in a broader context in step five, which is why we included a critical analysis component. Scoping reviews are considered iterative and reflexive based on the emerging evidence that occurs during the review (Arksey and O'Malley, 2005; Levac et al., 2010).

This scoping review builds on Bryanton et al. (2013) definition of parent-targeted postnatal educational intervention: structured interventions where parents are provided with education or information related to caring for their newborn that they would be responsible for providing which is meant to change behaviour and

improve newborn outcomes. While previous systematic reviews have explored the impact of healthcare provider-led postnatal interventions on newborn outcomes (Aker et al., 2016) and antenatal and postnatal parental education in high income countries (Bryanton et al., 2013; Gagnon and Sandall, 2007), it is unknown the breadth and depth of the literature on parent-targeted postnatal education interventions in low and middle-income countries. An initial search of the following databases for existing systematic reviews identified no existing reviews on this topic: MEDLINE, CINAHL, PROSPERO, Epistemonikos, Cochrane Library Database of Systematic Reviews, and the JBI Database of Systematic Reviews and Implementation Reports. The primary objective for this scoping review was to identify and map existing postnatal educational interventions targeting parents in low and middle-income countries. Based on the findings, the secondary objective was to conduct a critical analysis of the strengths and limitations of the educational strategies for parent-targeted postnatal education.

2.1. Search strategy

The following databases were searched on October 18, 2017: MedLine, CINAHL, and SCOPUS. The search strategy was developed in consultation with a health science librarian experienced in health science systematic review searches and is available as supplementary material. For the search strategy for low and middle-income countries, the predeveloped strategy by the Cochrane Effective Practice and Organization of Care group was utilized (Cochrane, 2012). Some other key search terms included “mother”, “father”, “postnatal care”, “infant”, “education” and “health information”. The search strategy was adapted to the specification of each database. To gain an understanding of current evidence, studies were limited to those published in English after 2000, which is when the Millennium Development Goals (MDGs) were implemented. With the introduction of the MDGs, there was a significant shift in worldwide focus on improving maternal and newborn health (Shetty, 2016).

2.2. Inclusion & exclusion criteria

While scoping reviews use an iterative approach with exclusion and inclusion criteria typically developed post hoc as the researcher becomes more familiar with the literature, the following *a priori* criteria were identified based on pre-existing knowledge of this topic. The targeted population primarily was parents (mothers and fathers) but family caregivers (e.g., grandparents, family members) were also included if they provided care to newborns. Studies were excluded if they targeted non-family caregivers (e.g., healthcare providers). Studies had to occur in low and middle-income countries as defined by the World Bank (2016). Interventions had to include the evaluation of at least one parent-targeted postnatal educational intervention related to improving essential newborn care (e.g., breastfeeding, skin-to-skin contact, combined newborn care interventions). Interventions were included if they reported on newborn outcomes (e.g., exclusive breastfeeding, skin-to-skin contact, mortality), parental outcomes associated with the provision of the educational intervention (e.g., knowledge, self-efficacy), and/or parental well-being (e.g., anxiety, stress). The educational intervention must have occurred for the first time at any point after birth and before six weeks postnatally. Articles were excluded if they focused solely on training health care providers (professional or community), if the interventions started before birth or began later than 6-weeks post-birth, if the intervention included community interventions that spanned antenatal and postnatal care, or if the intervention targeted maternal health outcomes only. Scoping reviews seek to identify all

literature, regardless of study design, and thus, all empirical study types were considered for inclusion (Arksey and O'Malley, 2005; Levac et al., 2010).

2.3. Data extraction

Based on the initial search, 9284 articles were identified after duplicates were removed. After a review of titles and abstracts by two independent reviewers, 9123 were excluded, leaving 161 articles for full-text review. After full text screening, an additional 84 articles were excluded for reasons outlined in the PRISMA diagram (see Fig. 1) (Moher et al., 2009). Following identification of included studies, one author was responsible for data extraction.

3. Results

3.1. Characteristics of included studies

Among the 77 included studies, there has been an increase in the yearly number of publications since 2010, with over half being published after 2014 ($n = 40$; see Fig. 2). As seen in Table 1, most of the study designs were quantitative ($n = 72$), with two studies utilizing mixed methods (Kritzing and van Rooyen, 2014; Varghese et al., 2014) and three using qualitative design (Bazzano et al., 2012; Ferecini et al., 2009; Lopes et al., 2007). Of the quantitative studies, 42% were randomized control trials or quasi-experimental studies using either a comparison group (28%) or pre-post comparison group (18%). Using the World Bank's (2016) classification, studies were conducted in lower-middle income (34%), upper-middle income (53%), or low-income countries (13%). Countries from which the highest number of studies were reported include India ($n = 16$) and Iran ($n = 13$). Studies came from countries in South Asia (27%), Middle East and North Africa (21%), east Asia and the Pacific (17%), Latin America and the Caribbean (14%), Europe and Central Asia (10%), and Sub-Saharan Africa (10%). Studies varied in targeting parents of full-term (55%) or preterm/low birth weight newborns (39%), with the remaining not specifying. All studies targeted mothers, with only seven studies also including fathers (Abdeyazdan et al., 2014; Beheshtipour et al., 2014; Çeber et al., 2013; Chen et al., 2016; Gu et al., 2016; Susin and Giugliani, 2008; Turan et al., 2008). No studies targeted other family members. Sample sizes ranged from 11 (Lopes et al., 2007) to 16,442 (Kramer et al., 2001); however, most were relatively small with half having a total sample size of 135 or less.

3.2. Postnatal education intervention content

In terms of newborn care education content areas covered, 61% of the studies targeted a single topic area (Table 2). Of the single topic interventions, 74.5% targeted breastfeeding or feeding education. Low-income and low-middle income countries were more likely to focus on a single intervention, compared to the upper-middle income countries which were more evenly split between single and multiple interventions (see Table 2). Interventions that addressed multiple content areas (39%) varied significantly in which aspects of newborn care was covered: breastfeeding was covered in 50% of interventions, followed by identifying newborn needs (43.3%), information related to care provided in the neonatal intensive care unit (NICU) (33.3%), and skin to skin contact/kangaroo mother care (36.7%). In nine studies (43.3%), the specific content of the intervention was not clarified beyond general education to parents about newborn care. Of note, these percentages might be an under-representation of the topics covered by each intervention because a clear description of the interventions was not always provided. According to WHO (2013) recommendations, postnatal care for full-term newborns should

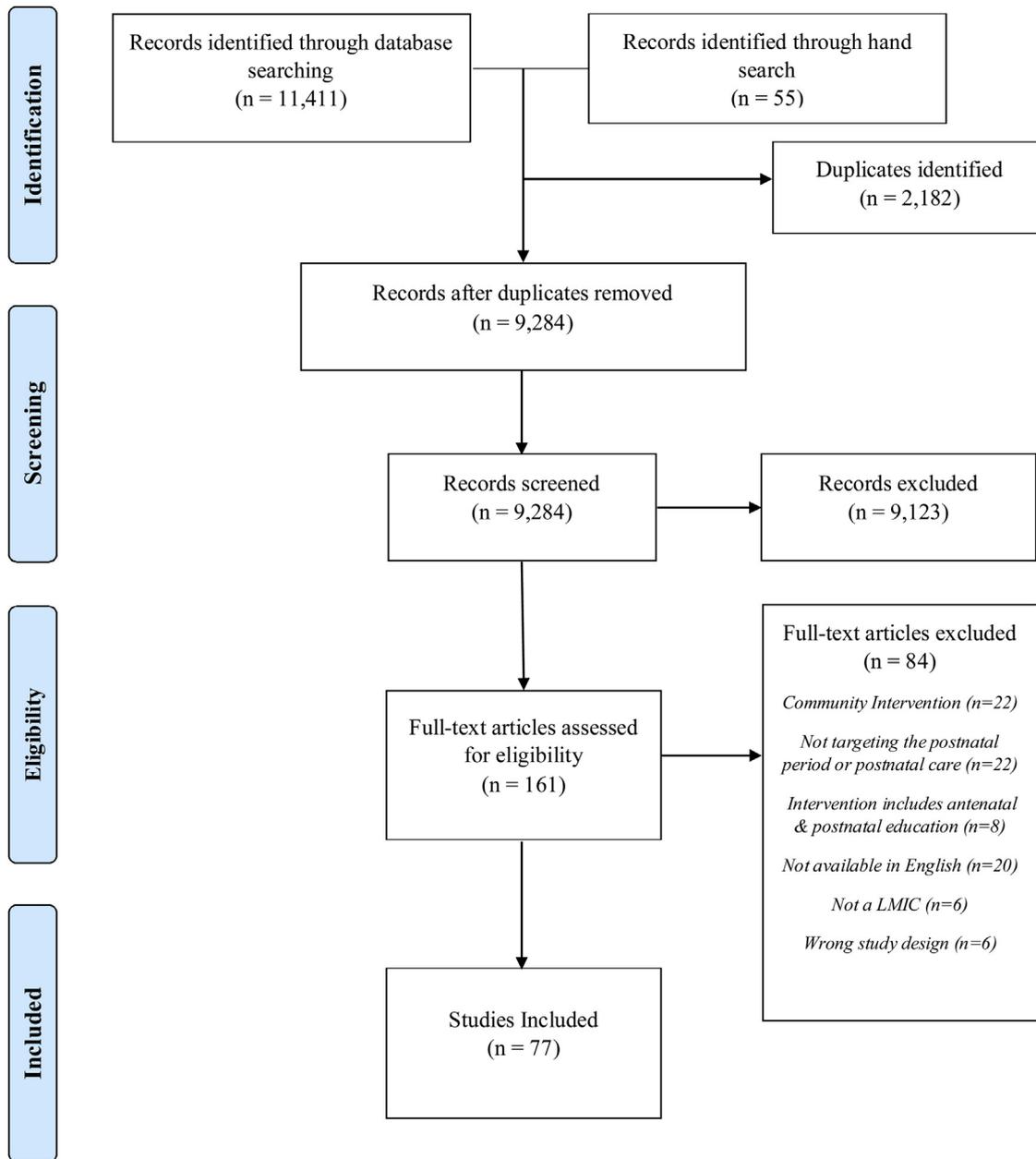


Fig. 1. PRISMA flow diagram of search and study selection process (Moher et al., 2009).

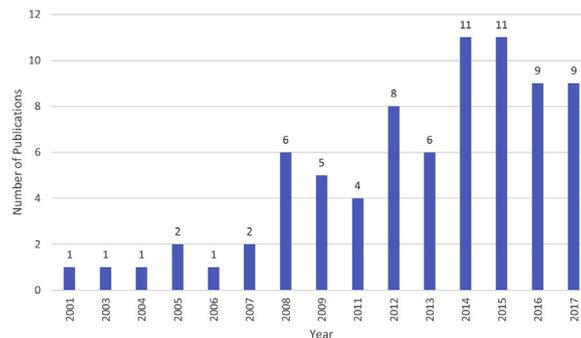


Fig. 2. Number of Publications per Year.

Table 1
Overview of included studies.

First Listed Author (Year)	Location	Methodology	Participants	Targeted Education	Maternal Outcomes	Newborn Outcomes	Location provided	Date of Last Follow-Up
Abdeyazdan et al. (2014)	Iran	Quasi-experimental	Preterm newborns, mothers & fathers	Multiple	Stress	–	NICU	Discharge
Adhisivam et al. (2016)	India	Quasi-experimental	Full term newborns, mothers only	Single	Knowledge	Exclusive breastfeeding	Postnatal ward	6 months
Agrasada et al. (2005)	Philippines	RCT	Preterm newborns, mothers only	Single	–	Morbidity, Weight gain, exclusive breastfeeding	Home visit	6 months
Agrasada and Kylberg (2009)	Philippines	RCT (secondary analysis)	Preterm newborns, mothers only	Single	–	Exclusive breastfeeding	Home visit	6 months
Agrasada et al. (2011)	Philippines	RCT (secondary analysis)	Preterm newborns, mothers only	Single	–	Morbidity, weight gain	Home visit	6 months
Ahmadi et al. (2016)	Iran	RCT	Preterm newborns, mothers only	Single	Knowledge	Weight gain, exclusive breastfeeding	NICU	4 months
Ahmed (2008)	Egypt	Quasi-experimental	Preterm newborns, mothers only	Single	Knowledge	Exclusive breastfeeding	NICU	3 months
Ahn and Kim (2004)	Korea	Quasi-experimental	Preterm newborns, mothers only	Multiple	Self-Efficacy, Support, Attachment	–	NICU & home visit	1 week
Aksu et al. (2011)	Turkey	RCT	Full term newborns, mothers only	Single	Knowledge	Exclusive breastfeeding	Postnatal ward & home visit	18 months
Albernaz et al. (2003)	Brazil	RCT	Full term newborns, mothers only	Single	–	Weight gain, exclusive breastfeeding	Postnatal ward & home visit	4 months
Awasthi et al. (2009)	India	Quasi-experimental	Full term newborns, mothers only	Single	–	Morbidity, immunization, care seeking	Postnatal ward	2 months
Bagherinia et al. (2017)	Iran	RCT	Full term newborns, mothers only	Multiple	Self-efficacy	–	Clinic visits & remote follow-up	2 months
Bala (2013)	India	Quasi-experimental	Full term newborns, mothers only	Multiple	Knowledge	–	Postnatal ward	Discharge
Bashour et al. (2008)	Syria	RCT	Full term newborns, mothers only	Multiple	–	Mortality, morbidity, exclusive breastfeeding, immunization, care seeking	Home visit	4 months
Bastani et al. (2015)	Iran	RCT	Preterm newborns, mothers only	Multiple	Satisfaction, re-admission rates	–	NICU	Discharge
Bazzano et al. (2012)	Ghana	Qualitative	Full term newborns, mothers only	Single	Behavior	–	Home visit	1 week
Beheshtipour et al. (2014)	Iran	RCT	Preterm newborns, mothers & fathers	Multiple	Stress	–	NICU	1 week
Boo and Jamli (2007)	Malaysia	RCT	Preterm newborns, mothers only	Single	–	Morbidity, weight gain	NICU	Discharge
Borimnejad et al. (2012)	Iran	RCT	Full term newborns, mothers only	Multiple	Attachment	Weight gain	Postnatal ward	2 months
Borimnejad et al. (2013)	Iran	Quasi-experimental	Preterm newborns, mothers only	Multiple	Stress	–	NICU	Discharge
Ceber (2013)	Turkey	Quasi-experimental	Full term newborns, mothers & fathers	Multiple	Knowledge	–	Home visit	40 days
Chandrashekhar et al. (2012)	India	Quasi-experimental	Full term newborns, mothers only	Single	Knowledge	–	Clinic visits	Discharge
Chen et al. (2016)	China	Quasi-experimental	Preterm newborns, mothers & fathers	Multiple	Knowledge, Support	Weight gain	NICU	Discharge
Chourasia et al. (2013)	India	Quasi-experimental	Preterm newborns, mothers only	Multiple	Stress	–	NICU	Discharge
Çinar and Öztürk (2014)	Turkey	Quasi-experimental	Full term newborns, mothers only	Multiple	Self-Efficacy, Attachment	–	Home visit	2 months
Dehkhoda et al. (2013)	Iran	Quasi-experimental	Preterm newborns, mothers only	Single	–	Weight gain, exclusive breastfeeding, skin-to-skin contact	NICU	2 weeks
Delgado Galeano and Carvajal (2016)	Colombia	Correlational	Preterm newborns, mothers only	Multiple	Stress	–	NICU	Discharge
de Oliveira et al. (2006)	Brazil	RCT	Full term newborns, mothers only	Single	–	Exclusive breastfeeding	Postnatal ward	4 weeks

Table 1 (Continued)

First Listed Author (Year)	Location	Methodology	Participants	Targeted Education	Maternal Outcomes	Newborn Outcomes	Location provided	Date of Last Follow-Up
Dhingra (2015)	Tanzania	RCT	Full term newborns, mothers only	Single	–	Improved cord care	Postnatal ward & home visit ³	10 days
Dodt (2015)	Brazil	Quasi-experimental	Full term newborns, mothers only	Single	Self-Efficacy	Exclusive breastfeeding	Postnatal ward	2 months
Dsouza (2009)	India	Quasi-experimental	Full term newborns, mothers only	Single	Knowledge	–	Postnatal ward	8 days
Emmanuel (2017)	India	Quasi-experimental	Preterm newborns, mothers only	Multiple	Stress	–	NICU	Discharge
Ferecini et al. (2009)	Brazil	Qualitative	Preterm newborns, mothers only	Multiple	Knowledge	–	NICU	Discharge
Gabida et al. (2015)	Zimbabwe	RCT	Full term newborns, mothers only	Single	–	Morbidity, Exclusive Breastfeeding, immunization, Care seeking	Home visits	5 months
Ghiasvand et al. (2017)	Iran	Quasi-experimental	Full term newborns, mothers only	Multiple	Stress	–	Postnatal ward	2 months
Gao et al. (2015)	China	RCT	Full term newborns, mothers only	Multiple	Self-Efficacy, Support, Stress	–	Postnatal ward & remote follow-up	6 weeks
Godati et al. (2017)	India	Quasi-experimental	Full term newborns, mothers only	Multiple	Knowledge	–	Postnatal ward	4 weeks
Gomanthi (2014)	India	Quasi-experimental	Full term newborns, mothers only	Single	Knowledge	–	Postnatal ward	Discharge
Gu et al. (2016)	China	RCT	Full term newborns, mothers & father	Single	–	Exclusive Breastfeeding	Postnatal ward, clinic visits & remote follow-up	6 months
Huang and Li (2017)	Cambodian	Survey	Full term newborns, mothers only	Multiple	–	–	Remote follow-up	4 weeks
Jakobsen et al. (2008)	Guinea-Bissau	Quasi-experimental	Full term newborns, mothers only	Single	–	Mortality, morbidity, Weight gain, exclusive breastfeeding	Home visits	6 months
Jennings et al. (2014)	Benin	RCT	Full term newborns, mothers only	Multiple	Knowledge	Delayed bathing	Postnatal ward	Discharge
Jesmin et al. (2015)	Bangladesh	Quasi-experimental	Full term newborns, mothers only	Single	Knowledge	Exclusive Breastfeeding	Postnatal ward	6 weeks
Kalita (2015)	India	Quasi-experimental	Newborns, mother only	Single	Knowledge	–	Postnatal ward	Discharge
Kang et al. (2008)	Korea	Quasi-experimental	Full term newborns, mothers only	Single	Self-Efficacy	Exclusive Breastfeeding	Clinic visits	3 months
Karimi et al. (2013)	Iran	Quasi-experimental	Preterm newborns, mothers only	Single	Behavior	–	NICU	Discharge
Khreshheh et al. (2011)	Jordan	RCT	Full term newborns, mothers only	Single	Knowledge	Weight gain, exclusive breastfeeding	Postnatal ward & remote follow-up	6 months
Kramer et al. (2001)	Belarus	RCT	Full term newborns, mothers only	Single	–	Morbidity, exclusive breastfeeding	Postnatal ward	12 months
Kritzing and van Rooyen (2014)	South Africa	Qualitative	Preterm newborns, mothers only	Single	Knowledge, Behavior	Skin-to-skin contact	NICU	Discharge
Küçükoglu and Çelebioglu (2014)	Turkey	Quasi-experimental	Preterm newborns, mothers only	Single	Self-Efficacy	Exclusive Breastfeeding	Postnatal ward	6 months
Leite et al. (2005)	Brazil	RCT	Preterm newborns, mothers only	Single	–	Exclusive Breastfeeding	Home visit	4 months
Lopes et al. (2007)	Brazil	Qualitative	Preterm newborns, mothers only	Multiple	Support	–	Home visit	Not stated
Maslowsky et al. (2016)	Ecuador	Quasi-experimental	Full term newborns, mothers only	Multiple	–	Exclusive Breastfeeding	Remote follow-up	3 months
Mianaei et al. (2014)	Iran	RCT	Preterm newborns, mothers only	Multiple	Behavior, Stress	–	NICU	Discharge
Mirmolaei et al. (2014)	Iran	RCT	Full term newborns, mothers only	Multiple	Behavior	–	Home visits & clinic visits	2 months
Mohammaddoost et al. (2016)	Iran	Quasi-experimental	Preterm newborns, mothers only	Multiple	–	Weight gain	NICU	Discharge

Table 1 (Continued)

First Listed Author (Year)	Location	Methodology	Participants	Targeted Education	Maternal Outcomes	Newborn Outcomes	Location provided	Date of Last Follow-Up
Mwendwa et al. (2012)	Kenya	RCT	Full term newborns, mothers only	Single	–	Mortality, morbidity, weight gain	Postnatal ward	Discharge
Owais et al. (2011)	Pakistan	RCT	Newborns, mothers only	Single	–	Immunization	Home visit	4 months
Özlües and Çelebioglu (2014)	Turkey	Quasi-experimental	Full term newborns, mothers only	Single	Attachment	Exclusive Breastfeeding	Postnatal ward	Discharge
Pereira et al. (2015)	India	Quasi-experimental	Full term newborns, mothers only	Single	–	Weight gain, exclusive breastfeeding	Postnatal ward	4 weeks
Patel and Koshy (2015)	India	Quasi-experimental	Newborns, mother only	Single	Knowledge	–	Postnatal ward	1 week
Rathod et al. (2017)	India	Quasi-experimental	Newborns, mother only	Single	Knowledge	–	Postnatal ward	Discharge
Rivarola et al. (2016)	Argentina	Quasi-experimental	Full term newborns, mothers only	Single	–	Exclusive breastfeeding	Postnatal ward	2 months
Sethi et al. (2017)	India	Quality Improvement	Preterm newborns, mothers only	Single	–	Exclusive breastfeeding	NICU	1 week
Shrestha et al. (2016)	Nepal	RCT	Full term newborns, mothers only	Multiple	Knowledge, Self-Efficacy, Stress	Weight gain, skin-to-skin contact, Care seeking	Postnatal ward & remote follow-up	6 weeks
Soofi et al. (2012)	Pakistan	RCT	Full term newborns, mothers only	Single	–	Mortality, morbidity, improved cord care	Postnatal ward	4 weeks
Susin and Giugliani (2008)	Brazil	Quasi-experimental	Full term newborns, mothers & fathers	Single	–	Exclusive Breastfeeding	Postnatal ward	6 months
Tahir and Al-Sadat (2013)	Malaysia	RCT	Full term newborns, mothers only	Single	–	Exclusive Breastfeeding	Remote follow-up	6 months
Tessier et al. (2009)	Colombia	RCT (secondary analysis)	Preterm newborns, mothers only	Single	Support	–	NICU	12 months
Thakur et al. (2012)	Bangladesh	Quasi-experimental	Preterm newborns, mothers only	Single	–	Morbidity, Weight gain, exclusive breastfeeding	Postnatal ward	2 months
Turan et al. (2008)	Turkey	Quasi-experimental	Preterm term newborns, mothers & fathers	Single	Stress	–	NICU	10 days
Varghese et al. (2014)	India	Mixed Methods	Newborns, mother only	Multiple	Support	Exclusive breastfeeding, skin-to-skin contact, immunization	Postnatal ward	3 months
Verma et al. (2017)	India	RCT	Preterm newborns, mothers only	Multiple	–	Mortality, morbidity. Exclusive breastfeeding	NICU	Discharge
Wangruangsatid et al. (2012)	Thailand	RCT	Preterm newborns, mothers only	Multiple	–	Morbidity, weight gain	NICU	4 months
Wu et al. (2014)	China	Quasi-experimental	Full term newborns, mothers only	Single	Self-Efficacy	Exclusive breastfeeding	Postnatal ward & remote follow-up	2 months
Yilmaz et al. (2017)	Turkey	Cross-sectional	Full term newborns, mothers only	Single	–	Exclusive Breastfeeding	Postnatal ward	6 months
Yotebieng et al. (2015)	Congo	RCT	Full term newborns, mothers only	Single	–	Morbidity, exclusive breastfeeding	Postnatal ward & clinic visits	6 months

include assessment for danger signs, exclusive breastfeeding until six months of age, clean umbilical cord care, cleanliness to prevent infection, appropriate thermal care, immunization, and management of illness. The study by Shrestha and colleagues (2016) was the only one to specify use the WHO's guideline for postnatal care in the development of their intervention.

3.3. Educational strategies of postnatal education interventions

The strategies for providing the postnatal educational intervention to parents varied across the studies, with interventions using on average three different methods (see Table 3). Most included a verbal component (93.5%), written material (42.9%), and counseling or support (37.7%). This was also consistent across low, low-middle, and upper-middle income countries, with home visits

also likely to occur in low-income countries. Over half of the interventions (510.6) were a one-time interaction. In terms of location, the interventions provided in the hospital occurred on either on the postnatal ward (45.5%) or in the NICU (29.9%), followed by occurring at home (23.4%), at the clinic or hospital (7.8%), or virtually through an eHealth intervention, including phone or SMS (11.7%). Based on these identified strategies, a critical analysis of strengths and limitations of each follows in the discussion.

3.4. Intervention outcomes

The outcomes measured and reported varied across studies. Studies followed participants to various timepoints, ranging from discharge (n=22) to 18 months (n=1). The most common

Table 2
Content of Intervention.

	Overall Frequency (%)	Low Income Countries Frequency (%)	Low-Middle Income Countries Frequency (%)	Upper-Middle Income Countries Frequency (%)
Education Topic Focus (Single)	47 (61 %)	7 (14.9%)	19 (40.4%)	22 (46.8%)
Breastfeeding	35 (74.5 %)	4 (11.4%)	16 (45.7%)	15 (42.8%)
Kangaroo Mother Care	5 (10.6 %)	2 (40%)	–	3 (60%)
Preventing Infections	2 (4.3 %)	–	1 (50%)	1 (50%)
Clean Code Care	2 (4.3 %)	1 (50%)	1 (50%)	–
Immunization	1 (2.1 %)	–	1 (100%)	–
Recognizing Danger Signs	1 (2.1 %)	–	1 (100%)	–
Education Topic Focus (Multiple)*	30 (39 %)	3 (10%)	7 (23.3%)	20 (66.7%)
General/Unspecific education content	13 (43.3 %)	–	3 (23.1%)	10 (76.9%)
Breastfeeding	15 (50 %)	2 (13.3%)	4 (26.7%)	9 (60%)
Newborn Needs	13 (43.3 %)	3 (23.1%)	1 (7.7%)	9 (69.2%)
Information on NICU Care	10 (33.3 %)	–	3 (30%)	7 (70%)
Kangaroo Mother Care	11 (36.7 %)	2 (18.2%)	3 (27.3%)	6 (54.5%)
Preventing infections	9 (30 %)	1 (11.1%)	3 (33.3%)	5 (55.6%)
Recognizing Dangers Signs	8 (26.7 %)	1 (12.5%)	3 (37.5%)	4 (50%)
Immunization	7 (23.3 %)	1 (14.2%)	3 (42.9%)	3 (42.9%)
Maternal needs/self-care	6 (20 %)	–	–	6 (100%)
Management of illness/visit healthcare provider	4 (13.3 %)	1 (25%)	1 (25%)	2 (50%)
Clean cord care	4 (13.3 %)	2 (50%)	1 (25%)	1 (25%)

* categories do not tally to 100%.

Table 3
Description of Postnatal Education Intervention Strategies.

Method of Education	Overall Frequency (%) [*]	Low Income Countries Frequency (% out of 10)	Low-Middle Income Countries Frequency (% out of 26)	Upper-Middle Income Countries Frequency (% out of 41)
Verbal information	72 (93.5%)	10 (100%)	23 (88.5%)	39 (95.1%)
Written information	33 (42.9%)	5 (50%)	4 (15.4%)	24 (58.5%)
Support (i.e., counselling, psychological)	29 (37.7%)	4 (40%)	8 (30.8%)	17 (41.5%)
Role-playing/modeling	20 (26%)	2 (20%)	6 (23.1%)	12 (29.3%)
In-person home visit (i.e., lay, researcher, trained healthcare provider, community health worker)	16 (20.8%)	5 (50%)	2 (7.7%)	9 (22%)
Pictorial information	17 (22.1%)	4 (40%)	3 (11.5%)	10 (24.4%)
Distance follow-up (phone)	10 (13%)	1 (10%)	2 (7.7%)	7 (17.1%)
Small groups	9 (11.7%)	1 (10%)	–	8 (19.5%)
Video education	9 (11.7%)	1 (10%)	5 (19.2%)	3 (7.3%)
Simulation (i.e., model breasts)	8 (10.4%)	2 (20%)	1 (3.7%)	5 (12.2%)
Peer training	4 (5.2%)	–	3 (11.5%)	1 (2.4%)
Educational CD	4 (5.2%)	–	–	4 (9.8%)
Number of Education Interventions				
1**	39 (50.6%)	2 (20%)	17 (65.4%)	20 (48.8%)
2	7 (9.1%)	2 (20%)	–	5 (12.2%)
3	7 (9.1%)	1 (10%)	1 (3.8%)	5 (12.2%)
4	6 (7.8%)	1 (10%)	2 (7.7%)	3 (7.3%)
5	4 (5.2%)	1 (10%)	1 (3.8%)	2 (4.9%)
6	2 (2.6%)	1 (10%)	–	1 (2.4%)
7 or more	8 (10.4%)	1 (10%)	4 (15.4%)	3 (7.3%)
Unclear/not stated	4 (5.2%)	1 (10%)	1 (3.7%)	2 (4.9%)

* Does not equal 100% as it can be more than one; percentage is out of 77 total included studies.

** Includes interventions provided in hospital unless otherwise stated that more than one interaction occurred.

timepoints were discharge, 6 months (n=12), and 2 months (n=10). Maternal outcomes included knowledge (n=20), self-efficacy (n=9), anxiety and stress (n=11), behavior (n=5), care seeking (n=4), and feelings of support (n=6) and attachment (n=5). Measurement methods varied among outcomes with the only outcome that was somewhat consistently reported was maternal stress measured by the Parental Stressor Scale-NICU (PSS-NICU) (Abdeyazdan et al., 2014; Beheshtipour et al., 2014; Borimnejad et al., 2013; Chourasia et al., 2013; Emmanuel et al., 2017; Mianaei et al., 2014; Turan et al., 2008). Most outcomes were measured through non-standardized measures using study-specific questionnaires. On reported maternal outcomes, 89% were found to have a positive outcome after receiving a postnatal educational intervention (e.g., increase knowledge, decreased stress). For newborn outcomes, studies reported on exclusive

breastfeeding (n=33), newborn weight at follow-up (n=16), skin-to-skin contact (n=4), improved cord care (n=2), immunization (n=5), delayed bathing (n=1), newborn mortality (n=5), and newborn morbidities (n=14, e.g., diarrhea and sepsis). Newborn outcomes were typically collected via self-reported questionnaires completed by parents or during a follow-up appointment. On newborn outcomes, 56% reported a positive change at the last follow-up (i.e., increases in exclusive breastfeeding, decreasing morbidity) while 35% reported no change.

4. Discussion

The United Nations (2017) recently reported that 30 million newborns will die between 2017 and 2030 based on current trends, some of which could be prevented through accelerating

improvement in activities proven to reduce newborn mortality rates. This scoping review aimed to identify and map existing postnatal educational interventions targeting parents in low and middle-income countries. This review suggests that mothers are specifically being targeted for their educational needs during the postnatal period, with most of the studies being published in the last four years. Only seven studies also included fathers and none included other family members, which indicates an important programming gap in the current interventions. Targeting mothers, fathers, and other family members may help to ensure uptake and implementation of best newborn care in low and middle-income countries, as indicated by the gendered social roles whereby males are often decision-makers in care seeking behaviour while females are often the ones responsible for the provision of newborn care on a daily basis (World Health Organization, 2014b; Yavorksky et al., 2015). This gender divide is also seen among other family members such as grandmothers who also hold key roles in early newborn care, including providing assistance to mothers in the transition to motherhood and providing knowledge as advisors (Iganus et al., 2015). By including fathers and other family members in postnatal educational interventions, it could increase knowledge and disperse the caregiver burden across family members (Comrie-Thomson et al., 2015; Yavorksky et al., 2015). Given the predominant focus on biological mothers in parent-targeted postnatal intervention, acknowledgement of the ongoing gender-based exclusion of fathers/males, their potential role in improving health outcomes of newborns, and that the involvement of males in the care of newborns is still not socially accepted or widely adopted, further consideration is needed. As a future suggestion, there is a need for more sex- and gender-based analysis in such interventions and in future reviews.

Almost two-thirds of parent-targeted interventions focused on a single educational need, predominately breastfeeding, and of those that targeted multiple education areas, only one study reported using the WHO's guidelines for postnatal care to guide its intervention (Shrestha et al., 2016). This is not isolated, as a review on packaged interventions by Haws and colleagues (2007) for newborn health noted a gap in use of established, evidence-based recommendations in newborn interventions generally, suggesting this is an area where improvement is needed.

Postnatal educational interventions also varied in terms of methods of implementation, with most including a verbal teaching component. Written or pictorial information, role-playing or modeling, and media, such as video and audio tools, were also used. Interventions identified used on average three different methods during implementation. This is similar to a review conducted by Briscoe and Aboud (2012) on child health interventions in low and middle-income countries who found that among the 24 interventions examined, 21 used three or more techniques. Techniques that they identified fell into six categories: information sharing, performance-based (e.g., modeling, practice), problem solving, social support, materials (e.g., provision of bed nets), or media (e.g., pamphlets) (Briscoe and Aboud, 2012). The multi-model technique approach has been found to impact behaviour change, yet it is difficult to determine which methods (e.g., verbal instruction compared to modeling) influence the outcomes independently of each other (Briscoe and Aboud, 2012). Decisions regarding which techniques and in which combination would be most effective depends on the behaviour change desired and theoretical approach used.

Although this scoping review did not seek to synthesize study outcomes, when looking broadly at whether studies reported positive or negative findings, the impact of parent-targeted educational interventions is mixed. This inconsistency was also noted in a Cochrane review by Bryanton et al. (2013) who examined postnatal parent educational interventions in primarily

high-income countries and found that, of the 27 trials identified, only 13 outcomes were measured similarly enough to be meta-analyzed and only four had low enough heterogeneity to provide an overall estimate of effect. Echoing their recommendations and to facilitate a possible meta-analysis in the future, an increase in standardized outcome measures and time points is encouraged to be able to compare across studies. However, it must be recognized that this is an additional challenge in low and middle-income countries where language influences the validity of standardized tools, which tend to be created in English. Such standardized tools would need to be validated in the local language to be considered reliable and culturally appropriate. In the current review, studies that used standardized measures used different techniques to ensure usability in the local language, including face validity, use of forward-backward translation, and use of previously validated translated questionnaires.

While the impact on newborn outcomes is unclear due to variations in reporting, follow-up time points, and small sample sizes, when considering the effectiveness on parental outcomes, including knowledge, self-efficacy, support, attachment, and stress, it is evident that outcomes were consistently better for parents who received an educational intervention than those that did not. However, challenges remain in ensuring sufficient uptake and access for parents in relation to postnatal interventions. Given the evidence, it is important to examine the strength and limitations of the identified educational strategies. Parent-targeted postnatal educational interventions require considerable resources, time, and involvement of healthcare providers (Gilmer et al., 2016) and thus, it is essential that the best approaches are utilized to maximize positive outcomes and minimize burden.

5. Critical analysis of postnatal educational intervention strategies

In this scoping review, over half of the parent-targeted postnatal educational interventions were provided in hospital prior to discharge, followed by postnatal visits, either during home visits or at a clinic or hospital, or remotely through eHealth technology. This next section will critically analyze the top intervention strategies (in-hospital, postnatal follow-up visits, eHealth, or a combination) for their strength and limitations in terms of targeting parents for postnatal education.

5.1. In-hospital interventions

A strength of providing postnatal education prior to discharge is that parents who deliver in the hospital or clinic can be guaranteed to physically present on the postnatal ward for at least a few hours, during which they would be able to have access to the intervention. While ideally mothers would have received the recommended antenatal visits as well as attend the recommended postnatal checkups, this is not always the case (Owili et al., 2016; Singh et al., 2016). Thus, in-hospital education may be the only form of newborn education some parents receive. In this review, several studies concluded that in-hospital postnatal education provided to mothers improved maternal knowledge and resulted in behaviour change, such as exclusive breastfeeding and care seeking for newborn illness (Ahmadi et al., 2016; Ahmed, 2008; Awasthi et al., 2009). The support that staff provide in-hospital can play an important role in helping parents adjust to their new responsibilities by being addressing any questions or concerns that arise. It is also important that parents are educated while in the hospital, even if it does not impact observed behaviour change prior to discharge, to help parents be aware of newborn danger signs and challenges so that they can promptly return to receive appropriate postnatal care as needed (Jennings et al., 2014). This baseline knowledge is especially important if parents do not return for a

postnatal visit to ensure they are aware of key danger signs. Furthermore, this basic information can be the foundation to build on if additional postnatal care is received.

Another strength of providing postnatal education to parents while still in the hospital is that it can be cost-effective and can use different strategies to provide information. In-hospital interventions can use a multitude of methods to educate, including direct interaction with healthcare providers through verbal educational sessions, counselling, small group learning, modeling, or role-play. These in-person strategies can also be coupled with other methods including videos, pictorial information, or written material to improve uptake by parents. In-hospital training can and should also be reinforced over the hospital stay, balancing information needs of parents while attempting to avoid overwhelming them with information at a single point in time (Jennings et al., 2014). Since most hospitals have some level of discharge education in place for new parents, a strength of using in-hospital training is that it can be modified to reflect the individual needs of parents. Supporting and expanding the already present educational and clinical practice of healthcare providers on the postnatal unit would be a wise investment by government and health centres.

There are some limitations to providing postnatal education in-hospital before discharge, with the largest challenge being that parents do not tend to stay long in the hospital after birth in low and middle-income countries, averaging 1.5 days for vaginal birth and 4.5 days for cesarean sections, with 83.2% of mothers leaving less than 24 h after vaginal birth (Campbell et al., 2016). This short length of stay can limit the time available for healthcare providers to provide postnatal education. While WHO (2013) recommendations for postnatal care suggest that mothers should stay for at least 24 h after birth, most mothers are discharged well before that time. While ideal for improved quality of care, if hospitals and clinics shift towards keeping mother for the recommended 24 h to provide education, this would increase the costs for both the health system and families, which might not be a viable option. Furthermore, not all mothers give birth in health facilities in low and middle-income countries and more than 70% of mothers who deliver outside health facilities receive no postnatal care at all (World Health Organization, 2014b). Therefore, if postnatal education solely used this strategy, it would miss a number of mothers who do not deliver in health facilities or do not stay long enough to receive adequate postnatal education.

Another limitation to providing postnatal education in hospital is the potential burden on the healthcare provider to provide the training, especially for hospitals or clinics where there is currently limited to no education provided prior to discharge. Many low and middle-income countries have a critical shortage of healthcare providers (World Health Organization, 2006) and, as such, postnatal education delivery may be impeded by a lack of staffing resources, rather than a lack of desire or priority (Mselle et al., 2017). Additionally, some parents may be overwhelmed by the birth process and not able to take in information due to being tired, sore, or anxious while in the hospital (Aksu et al., 2011). While this was not discussed among many of the included studies, a consideration of the timing in the delivery of postnatal education should be examined to determine impact on uptake. Despite these limitations, evidence from this review suggests that there is a benefit to providing at least a brief postnatal educational intervention to parents prior to discharge, which can be enhanced by providing content that can be taken home to review later or in combination with additional strategies. Providing some education during this critical period ensures that parents are provided with key knowledge that they can use when they are at home and can seek additional clarification at follow-up postnatal visits should they attend.

5.2. Postnatal follow-up visits home visits

Another postnatal educational strategy to reach parents is to use the opportunity of a postnatal visit, either by healthcare providers (e.g., midwives) or community health workers at home or during a clinic visit by the parent and newborn. According to the WHO (2013), the recommended three postnatal visits before six weeks postpartum must be flexible in regards to the location of contact. One of the strengths of providing parent-targeted education at postnatal follow-up visits is that multi-modal methods of education can be used to enhance knowledge and self-efficacy, including verbal information, modeling or feedback, and counselling. It also offers the opportunity to provide a continuum of care across antenatal, postnatal, and childhood in hard to reach or rural places (Haws et al., 2007; Shetty, 2016). While the current review excluded community-based intervention packages that combined antenatal and postnatal care provided by community health workers, previous reviews have found that community health workers providing the continuum of care can improve newborn outcomes in low and middle-income countries (Gilmore and McAuliffe, 2013; Gogia and Sachdev, 2016; Lassi and Bhutta, 2015). Lassi and Bhutta (2015) also concluded that the most successful community-based interventions were those that emphasised involving family members, with community health workers playing a vital role in providing postnatal education to parents and other family members during a home visit. In the current review, studies found that even one home visit was able to improve newborn outcomes (Bashour et al., 2008).

Likewise, a strength of providing postnatal education when parents come to the hospital or clinic for one of their scheduled postnatal visits is that it can be provided by healthcare provider staff at regular intervals, in either an individual or group setting, using multi-modal methods for implementation. Similar to home visits, by providing education at clinic appointments or hospital follow-up visits allows direct interaction with a healthcare provider who can ensure appropriate advice and feedback is given during observation of parent-provided care, such as breastfeeding (Adhisivam et al., 2016). This can be of benefit to outcomes, even if other strategies were utilized as well, such as pre-discharge education.

There is a significant loss in the continuum of care between pregnancy and postnatal follow-up whereby parents may not receive any postnatal care contacts, and thus no postnatal education (Owili et al., 2016). Furthermore, if parents do seek postnatal care, not all clinics are able to provide individual education due to staff and time resource constraints (Langlois et al., 2015; Mselle et al., 2017). Concerns also exist around the scale-up and cost-effectiveness of community health workers providing postnatal education and care to parents in low and middle-income countries as home visits are expensive to implement, particularly in areas where resources are low and community health workers are not currently used (Bhutta et al., 2005; Gilmer et al., 2016). In the current review, Ahn and Kim (2004) found a significant positive effect of a home visit within one-week of delivery on maternal role adaptation and family functioning compared to standard care, yet the home visit was provided by the lead researcher, limiting scalability. Other studies have used midwives or nurses for home visits, which can be costly when implemented on a larger scale (Bashour et al., 2008; World Health Organization, 2013). However, if community health workers are used to provide postnatal home visits, the level of education, scope of practice, and ratio of community health workers to families needs to be considered in careful country-level planning which would vary depending on context and location (Hodgins et al., 2017). While the responsibilities of postnatal education targeting parents can be added to the existing scope of care provided by community health

workers in areas where they are currently being used, challenges exist in ensuring access to funding, ensuring quality of care, and determining frequency of visits (Sitrin et al., 2013). Many low and middle-income countries do not have primary health care systems that are able to achieve and maintain high postnatal visits coverage due to high costs and shortage of health care providers (Hodgins et al., 2017; World Health Organization, 2013). There are barriers to implementing this on a wide scale without significant country-level priority planning, which a country may or may not have the capacity to do.

5.3. eHealth strategies

Parent-targeted postnatal educational interventions utilizing eHealth technology offers a way to reach parents remotely through multi-modal techniques. eHealth technology is defined as the use of information and communication technologies for the purpose of health (WHO, 2016). Systematic reviews on eHealth in low and middle-income countries have shown a promising impact on clinical outcomes, adherence, and health communication, although evidence is still emerging and varied (Hurt et al., 2016; Obasola et al., 2015). A strength of providing postnatal education through eHealth technology is that it can be done relatively cost-effectively, especially when compared to multiple educational sessions provided in hospital or clinics (Maslowsky et al., 2016). eHealth interventions can be accessed remotely, reducing costs through decreased travel time and expenses while still providing access to and communication with healthcare providers (Hurt et al., 2016; World Health Organization, 2014b). It can be provided in the local language; be written (e.g., text messages), visual (e.g., graphics, videos), or oral (e.g., voice calls); and can be used as reference material to ensure consistent, accurate, evidence-based messaging (Gabida et al., 2015; Huang and Li, 2017). eHealth can reach a large number of parents, regardless of how far away they live from a health facility (Obasola et al., 2015). Depending on the intervention, it can be accessed on the parents own time (e.g., mobile application or call-in option) and provided and/or developed by local healthcare providers knowledgeable in essential newborn care within the local context.

The limitation of providing postnatal education via eHealth technology is that it requires that families have access to mobile technology, such as a phone or Internet. While many low and middle-income countries have leapfrogged technology with access to mobile phones, usage can vary due to access barriers including electricity to charge phones, poor infrastructure, or insufficient access to capital for phone credits (Hurt et al., 2016). Another limitation of using eHealth interventions is not being able to demonstrate or observe any difficulties in person to provide hands-on teaching or feedback. Due to the novelty of eHealth interventions and the unique challenges in low and middle-income countries, it offers significant opportunity to increase reach, yet issues related to access would need to be addressed.

5.4. Combination of strategies

Several studies in this review utilized a combined implementation approach. Combining in-hospital training with other strategies, including home visits or eHealth, was found to reinforce the information provided and improve outcomes over time (Abdeyazdan et al., 2014; Aksu et al., 2011; Gu et al., 2016). By using a combined approach, it could reduce the burden on healthcare providers to provide all necessary training in-hospital prior to discharge when the parents may not be emotionally or physically ready to receive information. A combined approach is also recommended by the WHO where postnatal visits can be complemented by mobile phone-based contact (World Health

Organization, 2013). This could also address some of the limitations of other interventions including reducing the number of home visits needed by community health workers, making it more cost-effective. It could also provide some basic training in hospital in case parents do not attend a post-natal clinic within the first six weeks and could allow for some hands-on teaching that eHealth or mass media interventions may be lacking. Recommendations exist to prioritize in-hospital pre-discharge education interventions to ensure that basic information is provided to parents who may not be able to attend a postnatal visit shortly after birth (Hodgins et al., 2017). While the ideal combination of education strategies depends on the location, parents' need, and feasibility, the findings of this scoping review suggest that combining multiple strategies for parent-targeted educational intervention may best improve outcomes. Combined interventions may also offer the advantage to use a number of strategies to provide postnatal education to parents and other family members. As noted in this review, most interventions solely targeted mothers, yet evidence suggests that other family members play a significant role in newborn health outcomes (Iganus et al., 2015; Rempel et al., 2017). By combining interventions, it can also encourage family learning when material is taken home, increasing the reach of the education to other family members (Ferecini et al., 2009).

While implementation strategies need to be tailored to the location where the intervention will be implemented, the opportunity to provide a brief intervention prior to discharge seems essential to provide parents with key knowledge related to newborn care and ensure awareness around the need for postnatal visits. However, in many low and middle-income countries, only mothers are allowed in the delivery and postnatal ward (Bohren et al., 2015), limiting the ability to provide postnatal education to mothers, fathers and other family members prior to discharge. Thus, by including another component, whether a postnatal visit or eHealth intervention, it offers the opportunity to reach other family members as well as reinforce the knowledge provided to the mother in hospital.

While postnatal visits offer the opportunity to provide continuing education, many parents do not seek or obtain the recommended number of postnatal visits, whether in clinics or with home visits (Langlois et al., 2015). As such, eHealth strategies should be considered in postnatal educational interventions to provide additional and ongoing support to parents. eHealth strategies can target all family members and be accessed when needed. eHealth strategies can also be multi-modal depending on which technology is used, providing written information, or the use of a mobile application, where pictorial or video information can be used in addition to written information. The specific content, techniques, and strategies would depend on the country's infrastructure and readiness for eHealth technologies. If appropriate, a combined approach of immediate education with access to an eHealth technology could be considered as an option in developing a parent-targeted postnatal education intervention to improve newborn care.

6. Study limitations

While this scoping review was conducted using a standardized approach and had two reviewers for title, abstract and full text screening, only one reviewer was involved in data extraction. The search strategy included only studies published after 2000, which may have missed some key articles discussing postnatal interventions prior to this time period. However, due to time limitations as well as the increased focus on maternal and newborn outcomes in 2000 with the launch of Millennium Development Goals (United Nations, 2000), targeting interventions after 2000 provides a

picture of the current evidence on postnatal interventions in low and middle-income countries. Another limitation is that quality appraisal was not completed and thus the quality of the included articles was not taken into consideration. Anecdotally, the general quality of the included studies would be considered moderate to low, with few studies providing sufficient detail on the intervention, sample size, and outcome measures to be of high quality. In addition, it is likely that there is a reporting bias as parent-targeted educational programs that exist may not be reported in the peer reviewed literature. Furthermore, a significant number of the outcomes were collected via maternal self-report, which may have influenced the reported outcomes. Use of combined reporting methods to collect data may add to the strength of the study findings and confidence of future studies.

7. Conclusion

This scoping review provides evidence that parent-targeted postnatal educational interventions vary in terms of educational topics covered, methods and location of interventions, and outcomes examined. While the best strategies of implementing of postnatal education interventions to parents are not clearly determined, evidence from this scoping review suggests that most educational strategies currently used showed positive impacts on maternal outcomes. Moving forward, it will be key for parent-targeted postnatal educational interventions to use existing guidelines, such as the WHO's (2013) recommendations for postnatal care, to ensure evidence-based information is consistently provided to mothers, fathers and other family members. Further work is needed to evaluate the impact on newborn outcomes and to identify the most effective methods and timing of the interventions as well as an expansion to a greater inclusion of fathers and other family members.

Acknowledgements

JD is funded through a Canadian Institute of Health Research Doctoral Award to honor Nelson Mandela (FRN154341) as a PhD in Health trainee at Dalhousie University. MCY is funded through the Canadian Child Health Clinician Scientist Program Career Development and Canadian Institute of Health Research New Investigator.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ijnurstu.2019.03.011>.

References

- Abdeyazdan, Z., Shahkolahi, Z., Mehrabi, T., Hajiheidari, M., 2014. A family support intervention to reduce stress among parents of preterm infants in neonatal intensive care unit. *Iran. J. Nurs. Midwifery Res.* 19, 349–353.
- Adhisivam, B., Vishnu Bhat, B., Poorna, R., Thulasingham, M., Pournami, F., Joy, R., 2016. Postnatal counseling on exclusive breastfeeding using video - experience from a tertiary care teaching hospital, south India. *J. Matern. Fetal. Neonatal. Med.* 7058, 1–17.
- Agrasada, G.V., Kylberg, E., 2009. When and why Filipino mothers of term low birth weight infants interrupted breastfeeding exclusively. *Breastfeed. Rev.* 17, 5–10.
- Agrasada, G.V., Gustafsson, J., Kylberg, E., Ewald, U., 2005. Postnatal peer counselling on exclusive breastfeeding of low-birthweight infants: a randomized, controlled trial. *Acta Paediatr.* 94, 1109–1115. doi:<http://dx.doi.org/10.1080/08035250510025752>.
- Agrasada, G.V., Ewald, U., Kylberg, E., Gustafsson, J., 2011. Exclusive breastfeeding of low birth weight infants for the first six months: infant morbidity and maternal and infant anthropometry. *Asia Pac. J. Clin. Nutr.* 20, 62–68.
- Ahmadi, S., Kazemi, F., Masoumi, S.Z., Parsa, P., Roshanaei, G., 2016. Intervention based on BASNEF model increases exclusive breastfeeding in preterm infants in Iran: a randomized controlled trial. *Int. Breastfeed. J.* 11, 30.
- Ahmed, A.H., 2008. Breastfeeding preterm infants: an educational program to support mothers of preterm infants in Cairo, Egypt. *Pediatr. Nurs.* 34 (125–30), 138.
- Ahn, Y.-M., Kim, M.-R., 2004. The effects of a home-visiting discharge education on maternal self-esteem, maternal attachment, postpartum depression and family function in the mothers of NICU infants. *Taeahan Kanho Hakhoe Chi* 34, 1468–1476 2004121468 [pii].
- Aksu, H., Küçük, M., Düzgün, G., 2011. The effect of postnatal breastfeeding education/support offered at home 3 days after delivery on breastfeeding duration and knowledge: a randomized trial. *J. Matern. Fetal. Neonatal. Med.* 24, 354–361. doi:<http://dx.doi.org/10.3109/14767058.2010.497569>.
- Alker, T., Sibbritt, D., Dawson, A., 2016. Workforce interventions to deliver postnatal care to improve neonatal outcomes in low- and lower-middle-income countries. *Asia Pacific J. Public Heal.* 28, 659–681. doi:<http://dx.doi.org/10.1177/1010539516656435>.
- Albernaz, E., Victora, C.G., Haisma, H., Wright, A., Coward, W.A., 2003. Lactation counseling increases breast-feeding duration but not breast milk intake as measured by isotopic methods. *J. Nutr.* 133, 205–210.
- Arksey, H., O'Malley, L., 2005. Scoping studies: towards a methodological framework. *Int. J. Soc. Res. Methodol. Theory Pract.* 8, 19–32. doi:<http://dx.doi.org/10.1080/1364557032000119616>.
- Awasthi, S., Srivastava, N.M., Agarwal, G.G., Pant, S., Ahluwalia, T.P., 2009. Effect of behaviour change communication on qualified medical care-seeking for sick neonates among urban poor in Lucknow, northern India: A before and after intervention study. *Trop. Med. Int. Health* 14, 1199–1209. doi:<http://dx.doi.org/10.1111/j.1365-3156.2009.02365.x>.
- Bagherinia, M., Mirghafourvand, M., Shafaie, F., 2017. The effect of educational package on functional status and maternal self-confidence of primiparous women in postpartum period: a randomized controlled clinical trial. *J. Matern. Fetal. Neonatal. Med.* 30, 2469–2475. doi:<http://dx.doi.org/10.1080/14767058.2016.1253061>.
- Bala, K., 2013. Effectiveness of an 'Instructional Teaching Programme' (ITP) on the knowledge of postnatal mothers regarding newborn care. *IOSR J. Nurs. Heal. Sci.* 2, 24–30.
- Bashour, H.N., Kharouf, M.H., AbdulSalam, A.A., El Asmar, K., Tabbaa, M.A., Cheikha, S.A., 2008. Effect of postnatal home visits on maternal/infant outcomes in Syria: a randomized controlled trial. *Public Health Nurs.* 25, 115–125. doi:<http://dx.doi.org/10.1111/j.1525-1446.2008.00688.x>.
- Bastani, F., Abadi, T.A., Haghani, H., 2015. Effect of family-centered care on improving parental satisfaction and reducing readmission among premature infants: a randomized controlled trial. *J. Clin. Diagn. Res.* 9, SC04–SC08. doi:<http://dx.doi.org/10.7860/JCDR/2015/10356.5444>.
- Bazzano, A., Hill, Z., Tawiah-Agyemang, C., Manu, A., ten Asbroek, G., Kirkwood, B., 2012. Introducing home based skin-to-skin care for low birth weight newborns: a pilot approach to education and counseling in Ghana. *Glob. Health Promot.* 19, 42–49. doi:<http://dx.doi.org/10.1177/1757975912453185>.
- Beheshtipour, N., Baharlu, S.M., Montaseri, S., Razavinezhad Ardakani, S.M., 2014. The effect of the educational program on Iranian premature infants' parental stress in a neonatal intensive care unit: a double-blind randomized controlled trial. *Int. J. Community Based Nurs. Midwifery* 2, 240–250.
- Bhutta, Z.A., Darmstadt, G.L., Hasan, B.S., Haws, R.A., 2005. Community-based interventions for improving perinatal and neonatal health outcomes in developing countries: a review of the evidence. *Pediatrics* 115, 519–617. doi:<http://dx.doi.org/10.1542/peds.2004-1441>.
- Bohren, M.A., Vogel, J.P., Hunter, E.C., Lutsiv, O., Makh, S.K., Souza, J.P., Aguiar, C., Saraiva Coneglian, F., Diniz, A.L.A., Tunçalp, Ö., Javadi, D., Oladapo, O.T., Khosla, R., Hindin, M.J., Gülmezoglu, A.M., 2015. The mistreatment of women during childbirth in health facilities globally: a mixed-methods systematic review. *PLoS Med.* 12, 1–33. doi:<http://dx.doi.org/10.1371/journal.pmed.1001847>.
- Boo, N.Y., Jamli, F.M., 2007. Short duration of skin-to-skin contact: effects on growth and breastfeeding. *J. Paediatr. Child Health* 43, 831–836. doi:<http://dx.doi.org/10.1111/j.1440-1754.2007.01198.x>.
- Borimnejad, L., Mehrnush, N., Seyed-fatemi, N., Haghani, H., Resources, H., Intensive, N., Unit, C., 2012. The effect of empowerment program on mother-infant interaction and weight gain in preterm infants. *Zahedan J. Res. Med. Sci.* 14, 19–23.
- Borimnejad, L., Mehrmoosh, N., Fatemi, N.S., Haghani, H., 2013. Impacts of creating opportunities for parent empowerment on maternal stress: a quasi-experimental study. *Iran. J. Nurs. Midwifery Res.* 18, 218–221.
- Briscoe, C., Aboud, F., 2012. Behaviour change communication targeting four health behaviours in developing countries: a review of change techniques. *Soc. Sci. Med.* 75, 612–621. doi:<http://dx.doi.org/10.1016/j.socscimed.2012.03.016>.
- Bryanton, J., Beck, C.T., Montelpare, W., 2013. Postnatal parental education for optimizing infant general health and parent-infant relationships. *Cochrane Database Syst. Rev.* CD004068. doi:<http://dx.doi.org/10.1002/14651858.CD004068.pub3>.
- Campbell, O.M.R., Cegolon, L., Macleod, D., Benova, L., 2016. Length of stay after childbirth in 92 countries and associated factors in 30 low- and middle-income countries: compilation of reported data and a cross-sectional analysis from nationally representative surveys. *PLoS Med.* 13, 1–24. doi:<http://dx.doi.org/10.1371/journal.pmed.1001972>.
- Çeber, E., Soğukpınar, N., Karaca, B., Rabia, S., Genç, E., Öztürk, H., Zehra, C.A.N., Akmeşe, B., Özentürk, G., 2013. Mother and newborn care education program: the effects of "mother and newborn home care education program (MNHCEP)" on mother and persons providing care for mother/newborn. *Balikesia Saglik Bil Derg Cilt* 2, 22–29.
- Chandrashekar, R., Basagoudar, S., Muneshwar, S., 2012. Effectiveness of health education on increasing knowledge about breast feeding practices among postnatal women. *Int. J. Curr. Res. Rev.* 04, 113–118.

- Chen, Y., Zhang, J., Bai, J., 2016. Effect of an educational intervention on parental readiness for premature infant discharge from the neonatal intensive care units. *J. Adv. Nurs.* 72, 135–146. doi:<http://dx.doi.org/10.1111/jan.12817>.
- Chourasia, N., Surianarayanan, P., Bethou, A., Bhat, V., 2013. Stressors of NICU mothers and the effect of counseling-experience from a tertiary care teaching hospital. *India. J. Matern. Neonatal Med.* 26, 616–618. doi:<http://dx.doi.org/10.3109/14767058.2012.743522>.
- Çınar, İ.O., Öztürk, A., 2014. The effect of planned baby care education given to primiparous mothers on maternal attachment and self-confidence levels. *Health Care Women Int.* 35, 320–333. doi:<http://dx.doi.org/10.1080/07399332.2013.842240>.
- Cochrane, 2012. LMIC Filters [WWW Document] Webpage. URL . . (accessed 10.18.17) <http://epoc.cochrane.org/lmic-filters>.
- Comrie-Thomson, L., Tokhi, M., Ampt, F., Portela, A., Chersich, M., Khanna, R., Luchters, S., 2015. Challenging gender inequity through male involvement in maternal and newborn health: critical assessment of an emerging evidence base. *Cult. Health Sex* 17, 177–189. doi:<http://dx.doi.org/10.1080/13691058.2015.1053412>.
- Darmstadt, G.L., Zulficar, A., Cousens, S., Adam, T., Walker, N., De Bernis, L., 2005. Evidence-based, cost-effective interventions: How many newborn babies can we save? *Lancet* 365, 977–988.
- de Oliveira, L.D., Giugliani, E.R.J., do Espírito Santo, L.C., França, M.C.T., Weigert, E.M., Valdez, C., Kohler, F., de Lourenço Bonilha, A.L., 2006. Effect of intervention to improve breastfeeding technique on the frequency of exclusive breastfeeding and lactation-related problems. *J. Hum. Lact.* 22, 315–321. doi:<http://dx.doi.org/10.1177/0890334406290221>.
- Dehkhoda, N., Valizadeh, S., Jodeiry, B., Hosseini, M.-B., 2013. The effects of an educational and supportive re-lactation program on weight gain of preterm infants. *J. Caring Sci.* 2, 97–103. doi:<http://dx.doi.org/10.5681/jcs.2013.012>.
- Delgado Galeano, M., Carvajal, B.V., 2016. Coping in mothers of premature newborns after hospital discharge. *Newborn Infant Nurs. Rev.* 16, 105–109. doi:<http://dx.doi.org/10.1053/j.nainr.2016.08.007>.
- Dhingra, U., Sazawal, S., Dhingra, P., Dutta, A., Ali, S.M., Ame, S.M., Deb, S., Suleiman, A.M., Black, R.E., 2015. Trial of improved practices approach to explore the acceptability and feasibility of different modes of chlorhexidine application for neonatal cord care in Pemba, Tanzania. *BMC Pregnancy Childbirth* 15, 354. doi:<http://dx.doi.org/10.1186/s12884-015-0760-4>.
- Dickson, K.E., Simen-Kapeu, A., Kinney, M.V., Huicho, L., Vesel, L., Lackritz, E., De Graff Johnson, J., Von Xylander, S., Rafique, N., Sylla, M., Mwansambo, C., Daelmans, B., Lawn, J.E., 2014. Every newborn: health-systems bottlenecks and strategies to accelerate scale-up in countries. *Lancet* 384, 438–454. doi:[http://dx.doi.org/10.1016/S0140-6736\(14\)60582-1](http://dx.doi.org/10.1016/S0140-6736(14)60582-1).
- Doty, R.C.M., Joventino, E.S., Aquino, P.S., Almeida, P.C., Ximenes, L.B., 2015. An experimental study of an educational intervention to promote maternal self-efficacy in breastfeeding. *Rev. Lat. Am. Enfermagem* 23, 725–732. doi:<http://dx.doi.org/10.1590/0104-1169.02095.2609>.
- Dsouza, A., Valsaraj, B., Priyadarshini, S., 2009. Effectiveness of planned teaching programme on knowledge and attitudes about complementary feeding among mothers of infants. *Nurs. J. India* 100, 246–247.
- Emmanuel, F.J., Rajesh, P., Raj, E.V.N., 2017. Assess the effectiveness of an interventional package on level of stress among mothers of baby admitted in NICU. *Int. J. Nurs. Educ.* 9, 75. doi:<http://dx.doi.org/10.5958/0974-9357.2017.00085.X>.
- Ferecini, G.M., Fonseca, L.M.M., Leite, A.M., Daré, M.F., Assis, C.S., Scochi, C.G.S., 2009. Perceptions of mothers of premature babies regarding their experience with a health educational program. *ACTA Paul. Enferm.* 22, 250–256. doi:<http://dx.doi.org/10.1590/S0103-21002009000300003>.
- Gabida, M., Chemhuru, M., Tshimanga, M., Gombe, N.T., Takundwa, L., Bangure, D., 2015. Effect of distribution of educational material to mothers on duration and severity of diarrhoea and pneumonia, Midlands Province, Zimbabwe: a cluster randomized controlled trial. *Int. Breastfeed. J.* 10, 13. doi:<http://dx.doi.org/10.1186/s13006-015-0037-6>.
- Gagnon, A., Sandall, J., 2007. Individual or group antenatal education for childbirth or parenthood, or birth. *Cochrane Database Syst. Rev.* CD002869. doi:<http://dx.doi.org/10.1002/14651858.CD002869>.
- Gao, Ling, Xie, W., Yang, X., Chan, S.W., 2015. Effects of an interpersonal-psychotherapy-oriented postnatal programme for Chinese first-time mothers: a randomized controlled trial. *Int. J. Nurs. Stud.* 52, 22–29. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2014.06.006>.
- Ghassvand, F., Riazi, H., Hajian, S., Kazemi, E., Firoozi, A., 2017. The effect of a self-care program based on the teach back method on the postpartum quality of life. *Electron. Physician* 2008–5842. doi:<http://dx.doi.org/10.19082/4180>.
- Gilmer, C., Buchan, J.L., Letourneau, N., Bennett, C.T., Shanker, S.G., Fenwick, A., Smith-Chant, B., 2016. Parent education interventions designed to support the transition to parenthood: a realist review. *Int. J. Nurs. Stud.* 59, 118–133. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2016.03.015>.
- Gilmore, B., McAuliffe, E., 2013. Effectiveness of community health workers delivering preventive interventions for maternal and child health in low- and middle-income countries: a systematic review. *BMC Public Health* 13. doi:<http://dx.doi.org/10.1186/1471-2458-13-847>.
- Godati, M., Lavanyaauriti, U., Rani, R., 2017. Effectiveness of structured teaching programme knowledge and practice of post natal mothers regarding essential newborn care. *Int. J. Nurs. Educ.* 9, 127–131. doi:<http://dx.doi.org/10.5958/0974-9357.2017.00049.6>.
- Gogia, S., Sachdev, H.P.S., 2016. Home-based neonatal care by community health workers for preventing mortality in neonates in low- and middle-income countries: a systematic review. *J. Perinatol.* 36, S55–S73. doi:<http://dx.doi.org/10.1038/jp.2016.33>.
- Gomanthi, B., 2014. Effect of video-assisted teaching programme on management of breastfeeding problems. *Nurs. J. India* 105, 149–151.
- Gu, Y., Zhu, Y., Zhang, Z., Wan, H., 2016. Effectiveness of a theory-based breastfeeding promotion intervention on exclusive breastfeeding in China: a randomised controlled trial. *Midwifery* 42, 93–99. doi:<http://dx.doi.org/10.1016/j.midw.2016.09.010>.
- Haws, R.A., Thomas, A.L., Bhutta, Z.A., Darmstadt, G.L., 2007. Impact of packaged interventions on neonatal health: a review of the evidence. *Health Policy Plan.* 22, 193–215. doi:<http://dx.doi.org/10.1093/heapol/czm009>.
- Hodgins, S., McPherson, R., Kerber, K., 2017. Postnatal Care With a Focus on Home Visitation: a Design Decision-aid for Policymakers and Program Managers. Washington, DC .
- Huang, S., Li, M., 2017. Piloting a mHealth intervention to improve newborn care awareness among rural Cambodian mothers: a feasibility study. *BMC Pregnancy Childbirth* 17, 356. doi:<http://dx.doi.org/10.1186/s12884-017-1541-z>.
- Hurt, K., Walker, R.J., Campbell, J.A., Egedi, L.E., 2016. mHealth interventions in low and middle-income countries: a systematic review. *Glob. J. Health Sci.* 8, 183. doi:<http://dx.doi.org/10.5539/gjhs.v8n9p183>.
- Iganus, R., Hill, Z., Manzi, F., Bee, M., Amare, Y., Shamba, D., Odebiyi, A., Adejuyigbe, E., Omotara, B., Skordis-Worrall, J., 2015. Roles and responsibilities in newborn care in four African sites. *Trop. Med. Int. Health* 20, 1258–1264. doi:<http://dx.doi.org/10.1111/tmi.12550>.
- Jakobsen, M.S., Sodemann, M., Biai, S., Nielsen, J., Aaby, P., 2008. Promotion of exclusive breastfeeding is not likely to be cost effective in West Africa. A randomized intervention study from Guinea-Bissau. *Acta Paediatr. Int. J. Paediatr.* 97, 68–75. doi:<http://dx.doi.org/10.1111/j.1651-2227.2007.00532.x>.
- Jennings, L., Yebadokpo, A., Affo, J., Agbogbe, M., 2014. Use of job aids to improve facility-based postnatal counseling and care in rural Benin. *Matern. Child Health J.* 19, 557–565. doi:<http://dx.doi.org/10.1007/s10995-014-1537-5>.
- Jesmin, E., Chowdhury, R., Begum, S., Shapla, N., Shahida, S., 2015. Postnatal support strategies for improving rates of exclusive breastfeeding in case of caesarean baby. *Mymensingh Med. J.* 24, 750–755.
- Kalita, G., 2015. Effectiveness of planned teaching programme on working mothers regarding domiciliary management of expressed breastmilk and its storage in Bengaluru. *India. Int. J. Nurs. Educ.* 7, 63–70. doi:<http://dx.doi.org/10.5958/0974-9357.2015.00195.6>.
- Kang, J.S., Choi, S.Y., Ryu, E.J., 2008. Effects of a breastfeeding empowerment programme on Korean breastfeeding mothers: a quasi-experimental study. *Int. J. Nurs. Stud.* 45, 14–23. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2007.03.007>.
- Karimi, M., Esлами, Z., Shamsi, F., Moradi, J., Ahmadi, A.Y., Baghianimoghadam, B., 2013. The effect of educational intervention on increasing mothers' expressed breast milk bacterial contamination whose infants are admitted to neonatal intensive care unit. *J. Res. Health Sci.* 13, 43–47.
- Khreshkeh, R., Suhaimat, A., Jalamdeh, F., Barclay, L., 2011. The effect of a postnatal education and support program on breastfeeding among primiparous women: a randomized controlled trial. *Int. J. Nurs. Stud.* 48, 1058–1065. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2011.02.001>.
- Kramer, M.S., Chalmers, B., Hodnett, E.D., Vanilovich, I., Mezen, I., 2001. Promotion of Breastfeeding Intervention trial (PROBIT): a randomized trial in the republic of Belarus. *JAMA* 285, 413.
- Kritzinger, A., van Rooyen, E., 2014. The effect of formal, neonatal communication-intervention training on mothers in kangaroo care. *Afr. J. Prim. Health Care Fam. Med.* 6, 1–9. doi:<http://dx.doi.org/10.4102/phcfm.v6i1.675>.
- Küçükoglu, S., Çelebioglu, A., 2014. Effect of natural-feeding education on successful exclusive breast-feeding and breast-feeding self-efficacy of low-birth-weight infants. *Iran. J. Pediatr.* 24, 49–56.
- Langlois, É.V., Miszkurka, M., Zunzunegui, V., Ghaffar, A., Zunzunegui, M.V., Ghaffar, A., Ziegler, K., Karp, I., 2015. Inequities in postnatal care in low- and middle-income countries: a systematic review and meta-analysis. *Bull. World Health Organ.* 93, 259G–270G. doi:<http://dx.doi.org/10.2471/BLT.14.140996>.
- Lassi, Z.S., Bhutta, Z.A., 2015. Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes. *Cochrane Database Syst. Rev.* doi:<http://dx.doi.org/10.1002/14651858.CD007754>.
- Leite, A.M., Puccini, R.F., Atalah, A.N., Alves Da Cunha, A.L., Machado, M.T., 2005. Effectiveness of home-based peer counselling to promote breastfeeding in the northeast of Brazil: a randomized clinical trial. *Acta Paediatr. Int. J. Paediatr.* 94, 741–746. doi:<http://dx.doi.org/10.1080/08035250410023854>.
- Levac, D., Colquhoun, H., O'Brien, K.K., 2010. Scoping studies: advancing the methodology. *Implement. Sci.* 5, 69. doi:<http://dx.doi.org/10.1186/1748-5908-5-69>.
- Lopes, T.C., Mota, J.A.C., Coelho, S., 2007. Perspectives from a home based neonatal care program in Brazil's Single Health System. *Rev. Lat. Am. Enfermagem* 15, 543–548. doi:<http://dx.doi.org/10.1590/S0104-11692007000400004>.
- Maslowsky, J., Frost, S., Hendrick, C.E., Trujillo Cruz, F.O., Merajver, S.D., Trujillo, F.O., Merajver, D., 2016. Effects of postpartum mobile phone-based education on maternal and infant health in Ecuador. *Int. J. Gynecol. Obstet.* 134, 93–98. doi:<http://dx.doi.org/10.1016/j.ijgo.2015.12.008>.
- Mianaei, S.J., Alaei Karahroudy, F., Rasouli, M., Zayeri, F., 2014. The effect of creating opportunities for parent empowerment programme on maternal stress, anxiety and participation in NICUs wards in Iran. *Iran. J. Nurs. Midwifery Res.* 19, 94–101.
- Mirmolaei, S.T., Valizadeh, M.A., Mahmoodi, M., Tavakol, Z., 2014. Comparison of effects of home visits and routine postpartum care on the healthy behaviors of Iranian low-risk mothers. *Int. J. Prev. Med.* 5, 61–68.

- Mohammaddoost, F., Mosayebi, Z., Peyrovi, H., Chehrzad, M.-M., Mehran, A., 2016. The effect of mothers' empowerment program on premature infants' weight gain and duration of hospitalization. *Iran. J. Nurs. Midwifery Res.* 21, 357. doi:<http://dx.doi.org/10.4103/1735-9066.185572>.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annu. Intern. Med.* 151, 264–269. doi:<http://dx.doi.org/10.1371/journal.pmed1000097>.
- Mselle, L.T., Aston, M., Kohi, T.W., Mbekenga, C., Macdonald, D., White, M., Price, S., Murphy, G.T., Hearn, S.O., Jefferies, K., 2017. The challenges of providing postpartum education in Dar es Salaam, Tanzania: narratives of nurse-midwives and obstetricians. *Qual. Health Res.* doi:<http://dx.doi.org/10.1177/1049732317717695>.
- Mwendwa, A.C., Musoke, R.N., Wamalwa, D.C., 2012. Impact of partial kangaroo mother care on growth rates and duration of hospital stay impact of partial kangaroo mother care on growth rates and duration of hospital stay of low birth weight infants At the kenyatta national hospital. *Nairobi. East Afr. Med. J.* 89, 53–58.
- Obasola, O.I., Mabawonku, I., Lagunju, I., 2015. A review of e-Health interventions for maternal and child health in sub-sahara Africa. *Matern. Child Health J.* 19, 1813–1824. doi:<http://dx.doi.org/10.1007/s10995-015-1695-0>.
- Owais, A., Hanif, B., Siddiqui, A.R., Agha, A., Zaidi, A.K., 2011. Does improving maternal knowledge of vaccines impact infant immunization rates? A community-based randomized-controlled trial in Karachi, Pakistan. *BMC Public Health* 11, 239. doi:<http://dx.doi.org/10.1186/1471-2458-11-239>.
- Owili, P.O., Muga, M.A., Chou, Y.-J., Hsu, Y.-H.E., Huang, N., Chien, L.-Y., 2016. Associations in the continuum of care for maternal, newborn and child health: a population-based study of 12 sub-Saharan Africa countries. *BMC Public Health* 16, 414. doi:<http://dx.doi.org/10.1186/s12889-016-3075-0>.
- Özlüses, E., Çelebioglu, A., 2014. Educating fathers to improve breastfeeding rates and paternal-infant attachment. *Indian Pediatr.* 51, 654–657. doi:<http://dx.doi.org/10.1007/s13312-014-0471-3>.
- Patel, S., Koshy, S.N.R.H., 2015. Effectiveness of structured teaching programme regarding exclusive breastfeeding among lactating mother at selected hospitals of Vadodara. *Int. J. Nurs. Educ.* 7, 11–14. doi:<http://dx.doi.org/10.5958/0974-9357.2015.00124.5>.
- Pereira, N.M.D., Verma, R.J., Kabra, N.S., 2015. Postnatal lactational counseling and neonatal weight pattern. *Indian Pediatr.* 52, 579–582. doi:<http://dx.doi.org/10.1007/s13312-015-0678-y>.
- Rathod, D., Thapa, R., Ravindra, H.N., Patel, V., Gadiya, P., 2017. A study to assess the effectiveness of planned teaching programme on knowledge regarding selected breast related problems and their management among postnatal women at selected hospital, Vadodara. *Int. J. Nurs. Educ.* 9.
- Rempel, L., Rempel, J., Khuc, T., Vui, L., 2017. Influence of father-infant relationship on infant development: a father-involvement intervention in Vietnam. *Dev. Psychol.* 53, 1844–1858. doi:<http://dx.doi.org/10.1037/dev0000390>.
- Rivarola, M., Reyes, P., Henson, C., Bosch, J., Atchabahian, P., Franzosi, R., Di Pietro, C., Balboni, C., Giglio, N., 2016. Impact of an educational intervention to improve adherence to the recommendations on safe infant sleep. *Arch. Argent. Pediatr.* 114, 223–231. doi:<http://dx.doi.org/10.5546/aap.2016.eng.223>.
- Sethi, A., Joshi, M., Thukral, A., Singh Dalal, J., Kumar Deorari, A., 2017. A quality improvement initiative: improving exclusive breastfeeding rates of preterm neonates. *Indian J. Pediatr.* 84, 322–325. doi:<http://dx.doi.org/10.1007/s12098-017-2306-4>.
- Shetty, A.K., 2016. Global maternal, newborn, and child health: successes, challenges, and opportunities. *Pediatr. Clin. North Am.* 63, 1–18. doi:<http://dx.doi.org/10.1016/j.pcl.2015.08.001>.
- Shrestha, S., Adachi, K., Petrini, M.A., Shrestha, S., Rana Khagi, B., 2016. Development and evaluation of a newborn care education programme in primiparous mothers in Nepal. *Midwifery* 42, 21–28.
- Sines, E., Syed, U., Wall, S., Worley, H., 2007. Postnatal care: a critical opportunity to save mothers and newborns. *Policy Perspect. Newborn Health*.
- Singh, K., Story, W.T., Moran, A.C., 2016. Assessing the continuum of care pathway for maternal health in South Asia and Sub-Saharan Africa. *Matern. Child Health J.* 20, 281–289. doi:<http://dx.doi.org/10.1007/s10995-015-1827-6>.
- Sitrin, D., Guenther, T., Murray, J., Pilgrim, N., Rubayet, S., Ligowe, R., Pun, B., Malla, H., Moran, A., 2013. Reaching mothers and babies with early postnatal home visits: the implementation realities of achieving high coverage in large-scale programs. *PLoS One* 8. doi:<http://dx.doi.org/10.1371/journal.pone.0068930>.
- Soofi, S., Cousens, S., Imdad, A., Bhutto, N., Ali, N., Bhutta, Z.A., 2012. Topical application of chlorhexidine to neonatal umbilical cords for prevention of omphalitis and neonatal mortality in a rural district of Pakistan: a community-based, cluster-randomised trial. *Lancet* 379, 1029–1036. doi:[http://dx.doi.org/10.1016/S0140-6736\(11\)61877-1](http://dx.doi.org/10.1016/S0140-6736(11)61877-1).
- Susin, L.R.O., Giugliani, E.R.J., 2008. Inclusion of fathers in an intervention to promote breastfeeding: impact on breastfeeding rates. *J. Hum. Lact.* 24, 386–392. doi:<http://dx.doi.org/10.1177/0890334408323545>.
- Tahir, N.M., Al-Sadat, N., 2013. Does telephone lactation counselling improve breastfeeding practices?: a randomised controlled trial. *Int. J. Nurs. Stud.* 50, 16–25. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2012.09.006>.
- Tessier, R., Charpak, N., Giron, M., Cristo, M., De Calume, Z.F., Ruiz-Peláez, J.G., 2009. Kangaroo mother care, home environment and father involvement in the first year of life: a randomized controlled study. *Acta Paediatr. Int. J. Paediatr.* 98, 1444–1450. doi:<http://dx.doi.org/10.1111/j.1651-2227.2009.01370.x>.
- Thakur, S.K., Roy, S.K., Paul, K., Khanam, M., Khatun, W., Sarker, D., 2012. Effect of nutrition education on exclusive breastfeeding for nutritional outcome of low birth weight babies. *Eur. J. Clin. Nutr.* 66, 376–381. doi:<http://dx.doi.org/10.1038/ejcn.2011.182>.
- Turan, T., Basbakkal, Z., Ozbek, S., 2008. Effect of nursing interventions on stressors of parents of premature infants in neonatal intensive care unit. *J. Clin. Nurs.* 17, 2856–2866. doi:<http://dx.doi.org/10.1111/j.1365-2702.2008.02307.x>.
- United Nations, 2000. Millennium Development Goals [WWW Document] Webpage. URL. . . (accessed 11.23.17) http://www.who.int/topics/millennium_development_goals/about/en/.
- United Nations, 2017. Levels & Trends in Child Mortality. New York, New York. .
- Varghese, B., Roy, R., Saha, S., Roalkvam, S., 2014. Fostering maternal and newborn care in India the Yashoda way: does this improve maternal and newborn care practices during institutional delivery? *PLoS One* 9 doi:<http://dx.doi.org/10.1371/journal.pone.0084145> e84145.
- Verma, A., Maria, A., Pandey, R.M., Hands, C., Verma, A.A.A., Sherwani, F., 2017. Family-centered care to complement care of sick newborns: a randomized controlled trial. *Indian Pediatr.* 54, 455–459. doi:<http://dx.doi.org/10.1007/s13312-017-1047-9>.
- Wangruangsattid, R., Srisuphan, W., Picheansathian, W., Yenbut, J., 2012. Effects of a transitional care program on premature infants and their mothers. *Pacific Rim Int. J. Nurs. Res.* 16, 294–312.
- World Bank, 2016. Country Income Groups [WWW Document] URL. World Bank. . (accessed 4.24.17) <http://data.worldbank.org/country>.
- World Health Organization, 2006. The World Health Report 2006: Working Together for Health. doi:<http://dx.doi.org/10.1186/1471-2458-5-67>.
- World Health Organization, 2013. Postnatal Care of the Mother and Newborn 2013 [WWW Document]. *World Heal. Organ.* 978 92 4 150664 9.
- World Health Organization, 2014a. World Health Statistics 2014. Geneva. .
- World Health Organization, 2014b. Every newborn: An Action Plan to End Preventable Deaths [WWW Document]. .
- World Health Organization, 2016. eHealth at WHO [WWW Document] URL. World Heal. Organ. . . (accessed 6.27.17) <http://www.who.int/ehealth/about/en/>.
- Wu, D.S., Hu, J., Mccooy, T.P., Efrid, J.T., 2014. The effects of a breastfeeding self-efficacy intervention on short-term breastfeeding outcomes among primiparous mothers in Wuhan, China. *J. Adv. Nurs.* 70, 1867–1879. doi:<http://dx.doi.org/10.1111/jan.12349>.
- Yavorksky, J., Kamp Dush, C.M., Schoppe-Sullivan, S., 2015. The production of inequality: the gender division of labor across the transition to parenthood. *J. Marriage Fam.* 77, 662–679. doi:<http://dx.doi.org/10.1111/jomf.12189>.
- Yilmaz, E., Doğa Öcal, F., Vural Yilmaz, Z., Ceyhan, M., Fadıl Kara, O., Küçüközkan, T., 2017. Early initiation and exclusive breastfeeding: factors influencing the attitudes of mothers who gave birth in a baby-friendly hospital. *Turkish J. Obstet. Gynecol.* 14, 1–9. doi:<http://dx.doi.org/10.4274/tjod.90018>.
- Yotebieng, M., Labbok, M., Soeters, H.M., Chalachala, J.L., Lapika, B., Vitta, B.S., Behets, F., 2015. Ten steps to successful breastfeeding programme to promote early initiation and exclusive breastfeeding in DR Congo: a cluster-randomised controlled trial. *Lancet Glob. Heal.* 3, e546–e555. doi:[http://dx.doi.org/10.1016/S2214-109X\(15\)00012-1](http://dx.doi.org/10.1016/S2214-109X(15)00012-1).