

# **Effectiveness of Text Messaging Interventions Designed to Influence Parents' Infant Feeding Practices**

## **A Focused Practice Question**

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 **Region of Peel**  
*Working for you*

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## Key Messages

1. Text messaging is an innovative communication method that public health can leverage to reach large populations. Research is increasing on the development and evaluation of text messaging interventions designed to provide information that results in improved health outcomes and/or changed health behaviors.
2. There is limited research on text messaging specifically to the target audience of parents with the goal of influencing their infant feeding practices.
3. Breastfeeding initiation and breastfeeding exclusivity maintenance can be improved with the use of text messaging interventions for parents.
4. The limited research available supports Peel Public Health in pursuing the development and evaluation of an intervention to text message parents with the goal of influencing parents' knowledge and behaviours around the feeding practices of their children.

## Issue & Context

Every year, approximately 15,000-16,000 babies are born in Peel (1) and their parents have access to many different information sources intended to help them raise their children with health as a priority. However, the credibility of these sources can vary greatly. Often this can lead to parents feeling overwhelmed with conflicting messages. The Parent Experiences Study (2014) conducted by Peel Public Health identified several types of “information challenges” for parents in the study, including: 1) being too busy with responsibilities to search for and sift through information; 2) receiving information at the “wrong time” or in ways that were not meaningful; and 3) lacking confidence in the information source (2).

The Nurturing the Next Generation strategic priority currently supports new parents through a variety of population-based activities (e.g., prenatal education, Parenting in Peel website and Facebook page, breastfeeding clinics and contact centre, and parenting call centre). These services each have limitations, including reach, accessibility, timeliness, and inconvenient access (e.g., not mobile friendly). With the rise of cellphone use across diverse populations in Canada, text messaging is a novel public health intervention approach that can reach a large portion of the general population with important personalized health messages in a convenient, timely and cost effective manner (3). Public health researchers have sought to capitalize on this innovative communication modality by developing and testing text messaging interventions designed to provide information that results in improved health outcomes and/or changed health behaviors (3).

Text messaging may be a promising intervention to address the issue of parents introducing solids to their infants too early or too late. Peel Public Health recommends that infants be introduced to solid foods at around six months of age, when a baby consistently demonstrates the signs of readiness for solid foods (4). However, parents are receiving conflicting advice on infant feeding (2) and local data indicate that almost a quarter of infants in Peel are being introduced to solid food too early (at less than five months of age) or too late (after 7 months of age) (5). This is an example of a health issue in which a text messaging intervention may be able to provide credible and timely information regarding recommended feeding practices that support child health. The recent developments in text messaging support Peel Public Health's investigation of this strategy for use with new parents.

## **Literature Review Question**

Are text messaging interventions effective at educating parents and influencing behaviours of parents that will improve health outcomes for their young children?

Population: Parents of children < 4 years of age

Intervention: Text messaging program

Control: No intervention or usual care

Outcome: Educating parents and influencing behaviours of parents that will improve health outcomes for their young children (<4 years of age)

## **Literature Search**

Seven databases were searched on May 25, 2016 with a date range of 2005 to present. The databases used in the search included Cochrane Database of Systematic Reviews, Global Health, Ovid Health, Ovid Healthstar, Ovid MEDLINE, PsycINFO, and CINAHL. The search was limited to guidelines, systematic reviews, and meta-analyses published in English. An additional search of single studies was conducted on June 8, 2016 with additional inclusion criteria specific to infant feeding.

A search of the grey literature was conducted on May 30 and 31, 2016. The websites searched included Health Canada, Dietitians of Canada – Practice-based Evidence in Nutrition, National Institute for Health and Clinical Excellence (NICE), World Health Organization, National Guideline Clearinghouse, TRIP Database, Centers for Disease Control and Prevention, and Institute of Medicine. A search for published reviews was also conducted on Google, Google Scholar, and Health Evidence on June 8, 2016. Details of the search strategies are outlined in Appendix A. The reference list of a related review of reviews on text messaging in public health was also searched.

## **Relevance Assessment**

Titles and abstracts were screened to determine articles for full text relevance assessment. The studies were assessed based on the following criteria:

Inclusion criteria: English language; published after 2009; practice guidelines, systematic reviews, meta-analyses or grey literature; text messaging intervention;

parents of children <4 years old; health outcomes assessed; infant feeding as part of intervention

Exclusion criteria: Not English language; adult health outcomes; duplicates

## **Results of the Search**

The search yielded 415 articles, including 11 duplicates. Based on relevance screening of the titles and abstracts, 388 articles were excluded and 16 articles were retrieved for full text review. Following the relevance assessment of full text, 3 articles were deemed relevant as confirmed in discussion with two additional reviewers and were brought forward for critical appraisal: one systematic review, one systematic review including a meta-analysis, and one review of systematic reviews. Initially, it was thought that infant feeding would not be included in the inclusion criteria as it was predicted to greatly limit the search results. However, a relevant systematic review with meta-analysis that included infant feeding was published at the time of relevance assessment and this enabled more strict inclusion criteria to be utilised. The review of systematic reviews did not meet the additional inclusion criteria in regards to the population of focus, as it was centred on adult health outcomes as opposed to children health outcomes. The additional systematic review was determined not to be relevant to the topic as it did not include any information regarding infant feeding. Therefore, the review of systematic reviews and the systematic review will not be summarized in data extraction and synthesis, but may be highlighted in the issue and discussion portions of this paper. Search results are found in Appendix B.

## Critical Appraisal

Based on the relevance assessment, only one article met the criteria to be critically appraised. Two independent reviewers critically appraised the article and disagreements were resolved through discussion. The systematic review was appraised using the Quality Assessment Tool – Review Articles from Health Evidence. The systematic review which included a meta-analysis was rated as strong.

## Description of Included Studies

The literature search did not identify high level evidence on the topic of texting parents specifically after the birth of their baby to influence infant feeding practices. A systematic review with meta-analysis was included as it described texting parents, including in the prenatal period, in regards to influencing the health and feeding of their children. Results related to the preconception period were not included in the data extraction and synthesis. The included review is:

- Lee, Nurmatov, Nwaru, Mukherjee, Grant and Pagliari, (2016) – Effectiveness of mHealth interventions for maternal, newborn and child health in low – and middle-income countries: Systematic review and meta-analysis. (6)

### Lee et al. (2016)

The systematic review and meta-analysis by Lee et al. (2016), rated as strong, sought to assess the effectiveness of mHealth<sup>1</sup> interventions for maternal, newborn and child

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<sup>1</sup> mHealth (definition): A component of eHealth. To date, no standardized definition of mHealth has been established. Also known as mobile health with medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices. (7)



health in low- and middle-income countries with a particular focus on studies reporting impacts on patient outcomes. Two conference abstracts and fifteen research articles, including 12 intervention and three observational studies, met inclusion criteria and were included in a narrative review. Three studies of minimal heterogeneity were included in a random-effects meta-analysis.

The target groups included women in the antenatal, intranatal<sup>2</sup>, and postnatal periods; newborns; children aged 0-5 years; and health workers through which interventions aimed at these groups are mediated. The methodological quality of the included studies was assessed and found two of the intervention studies were rated a low risk of bias, seven as moderate, and four at high risk of bias. One cohort study was graded high risk of bias, and a case-control and a before-and-after study were graded moderate risk of bias. Two included studies were only available as conference abstracts and the abstract authors provided enough additional information on one of these conference abstracts to allow for assessment of the study.

Twelve of the studies were intervention studies, comprising eight RCTs, two quasi-RCTs, one controlled clinical trial, and one uncontrolled before-and-after study. Two studies were cohort studies and one was a case-control study. The studies were all completed in low- or middle-income countries with pregnant women in 10 studies, children in five studies and village elders in one.

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<sup>2</sup> Intranatal (definition): occurring chiefly with reference to the child during the act of birth

The interventions studied included mobile phones (n=11), and short message service (SMS) and voice messaging (n=1) and voice calls (n=2). The interventions were classified into the following:

- information delivery (n=6),
- reminders (n=3),
- communication platform (n=2),
- data collection platform (n=2),
- test result turnaround (n=2), and
- psychological intervention (n=1).

All studies were published between 2008 and 2014. Refer to Appendix C for more details on the review and meta-analysis in the data extraction table.

## **Synthesis of Findings**

The systematic review with meta-analysis found supportive evidence in regards to the effectiveness of text messaging interventions to parents on influencing behaviours and knowledge that may improve health outcomes in their children. Three studies in the Lee et al. review compared the effect of SMS/cell phone versus no SMS on breastfeeding and/or other infant feeding related practices. The relevant findings are outlined below:

- **Breastfeeding initiation can be improved with the use of text messaging interventions intended for parents.**

The meta-analysis found the rates of breastfeeding initiation within one hour after birth were significantly higher with the group of mothers who received the SMS/cell phone

prenatal intervention versus routine prenatal care (OR 2.01, 95% CI 1.27–2.75,  $I^2=80.9\%$ ).

- **Exclusive breastfeeding maintenance can be improved with the use of text messaging interventions intended for parents.**

The meta-analysis found significant increases in the groups of mothers who received the text messaging interventions versus routine care in the rates of exclusive breastfeeding for three/four months (OR 1.88, 95% CI 1.26-2.50,  $I^2=52.8\%$ ) and for six months (OR 2.58, 95% CI 1.44–3.71,  $I^2=0.0\%$ ).

- **Text messaging interventions were also found to have positive associations, though not statistically significant, with recommended infant feeding practices, including the introduction of solids.**

The following outcomes showed positive associations (with no statistical significant difference) with the intervention of text messaging to mothers versus usual care:

- Introduction of solid foods before 6 months: SMS group 67.5%; Control group 61.3%; OR 1.3 (95% CI 0.9–1.8)
- Drinking from a cup at 12 months: SMS group 53.6%; Control group 46.5%; OR 1.3 (95% CI 0.9–2.0)
- Receiving food as a reward: SMS group 45.5%; Control group 33.6%; OR 1.5 (95% CI 1.0–2.3) NSD

- Taking a bottle to bed: SMS group 51.9%; Control group 49.8%; OR 1.1 (95% CI 0.7–1.6) NSD

- **The most common use of mHealth was for health information delivery.**

Based on the Lee et al. review authors' interpretations, the most common use of mobile health was for health information delivery, such as nutritional advice. This was followed by use:

- for reminders, primarily for clinic attendance,
- as a communication platform,
- for access to support from care providers,
- as a data collection platform,
- for test results,
- as part of peer support,
- as a means to deliver psychological (therapeutic) interventions.

## **Limitations and Gaps**

Due to the short history of texting interventions in health and the specificity of our inclusion criteria in this review, there are a number of limitations to consider:

The review by Lee et al. (2016) was focused on interventions in low or middle income countries. This is not an ideal population to compare with Peel.

The amount of research that has been completed in the area of text messaging parents to influence their behaviours and knowledge to improve health outcomes for their children is limited, likely due to the recentness of this type of intervention.

The authors of the included single studies did not explain the details of their interventions, including the frequency and style of text messages sent out.

Additionally, due to the small number of studies analysed (three from the selected systematic review), the results of the meta-analysis should be interpreted with caution.

## **Relevance to Practice**

Although the available evidence related to text message interventions for parents to influence health outcomes for their children is limited, the early results demonstrate that this is a promising intervention. It is recommended that Peel Public Health and the Family Health Division:

1. Pursue the development and evaluation of a text messaging intervention geared towards parents to influence infant feeding practices.
2. Monitor the topic area for new research regarding text messaging interventions geared towards parents of young children.
3. Seek guidance on text messaging interventions by conducting a literature scan of protocols from existing single studies completed on text messaging parents of young children (< 4 years) in order to guide project development related to text messaging in Family Health,

## References

1. Peel Data Centre. Quick stats – total number of live births. [Internet]. 2014. [cited 2016 April 12]. Available from:  
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<http://www.peelregion.ca/health/nurturing/pdf/NTNG-Parent-Experience-Study-A-Picture-of-Parenting-in-Peel.pdf>
3. Hall AK, Cole-Lewis H, Bernhardt JM. Mobile text messaging for health: a systematic review of reviews. *Annu Rev Public Health*. 2015 March 18; 36: 393–415. Available from:  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4406229/pdf/nihms677931.pdf>
4. Muresan J. Briefing note: appropriate timing for the introduction of solid foods. 2015. Region of Peel.
5. Region of Peel. Infant feeding surveillance system summary report: A Peel health technical report. [Internet]. 2013. [cited 2016 Feb 10]. Available upon request.
6. Lee SH, Nurmatov UB, Nwaru BI, Mukherjee M, Grant L, Pagliari C. Effectiveness of mHealth interventions for maternal, newborn and child health in low- and middle-income countries: Systematic review and meta-analysis. *J Global Health*. 2016 Jun; 6(1): 1-17.

7. World Health Organization. mHealth: New horizons for health through mobile technologies: Second global survey on eHealth.. Global Observatory for eHealth series – Volume 3. 2011, WHO Press, Switzerland.

[http://www.who.int/goe/publications/goe\\_mhealth\\_web.pdf](http://www.who.int/goe/publications/goe_mhealth_web.pdf)

## **Appendices**

**Appendix A: Search Strategy**

**Appendix B: Literature Search Flowchart**

**Appendix C: Data Extraction Tables**



## Appendix A: Search Strategy

### Search #1 - Reviews

Database: EBM Reviews - Cochrane Database of Systematic Reviews <2005 to May 25, 2016>, Global Health <1973 to 2016 Week 20>, Ovid Healthstar <1966 to April 2016>, Ovid MEDLINE(R) <1946 to May Week 3 2016>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <May 26, 2016>, PsycINFO <2002 to May Week 4 2016>

### Search Strategy:

- 
- 1 exp Cell Phones/ (15447)
  - 2 exp Text Messaging/ (2649)
  - 3 "texting".ti,ab. (1217)
  - 4 "text messag\*".ti,ab. (4901)
  - 5 exp Decision Making/ (358608)
  - 6 exp Attitude to Health/ (680928)
  - 7 exp Health Behavior/ (272537)
  - 8 exp Child Behavior/ (32533)
  - 9 "behav\*".ti,ab. (1962845)
  - 10 exp Motivation/ (284308)
  - 11 exp Choice Behavior/ (98737)
  - 12 exp Feeding Behavior/ (218221)
  - 13 "feed\*".ti,ab. (578752)
  - 14 ("theory" adj2 "planned behav\*").mp. [mp=ti, ab, tx, kw, ct, ot, bt, hw, id, cc, nm, kf, px, rx, ui, tc, tm] (7779)
  - 15 exp Parents/ (243683)
  - 16 exp Parenting/ (66587)
  - 17 exp Mother-Child Relations/ (46541)
  - 18 exp Parent-Child Relations/ (128404)
  - 19 exp Mothers/ (104808)
  - 20 "mother\*".ti,ab. (390456)
  - 21 exp Fathers/ (20561)
  - 22 1 or 2 or 3 or 4 (18499)
  - 23 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 (3673767)
  - 24 15 or 16 or 17 or 18 or 19 or 20 or 21 (621535)
  - 25 22 and 23 and 24 (279)
  - 26 limit 25 to (english language and yr="2009 -Current") [Limit not valid in CDSR; records were retained] (256)
  - 27 ("review\*" or "meta analys\*" or "synth\*" or "guideline\*").ti,ab. (5056421)
  - 28 26 and 27 (43)
  - 29 remove duplicates from 28 (22)

Search #2 – Reviews - CINAHL (May 25, 2016)

S1 (MH "Attitude to Health+") OR (MH "Health Promotion+") OR (MH "Parental Attitudes+")

S2 (MH "Health Behaviour+") OR "behav\*"

S3 (MH "Decision Making, Family") OR (MH "Decision Making+")

S4 (MH "Parenting") OR (MH "Parenting Education") OR "parent"

S5 S1 OR S2 OR S3

S6 (MH "Single Parent") OR (MH "Mothers") OR (MH "Mother-Child Relations") OR (MF "Foster Parents") OR (MH "Adolescent Mothers") OR (MH "Mothers, Working") OR (MH "Mother-Infant Relations")

S7 (MH "Father-Child Relations") OR (MH "Father-Infant Relations") OR (MH "Adolescent Fathers") OR (MH "Expectant Fathers")

S8 "mother" PR "father"

S9 S4 OR S6 OR S7 OR S8

S10 (MH "Text Messaging") OR "texting"

S11 (MH "Cellular Phone+") OR (MH Smartphone+)

S12 "text messag\*"

S13 S10 OR S11 OR S12

S14 S5 AND S9 AND S13

S15 S5 AND S9 AND S13

S16 S5 AND S9 AND S13

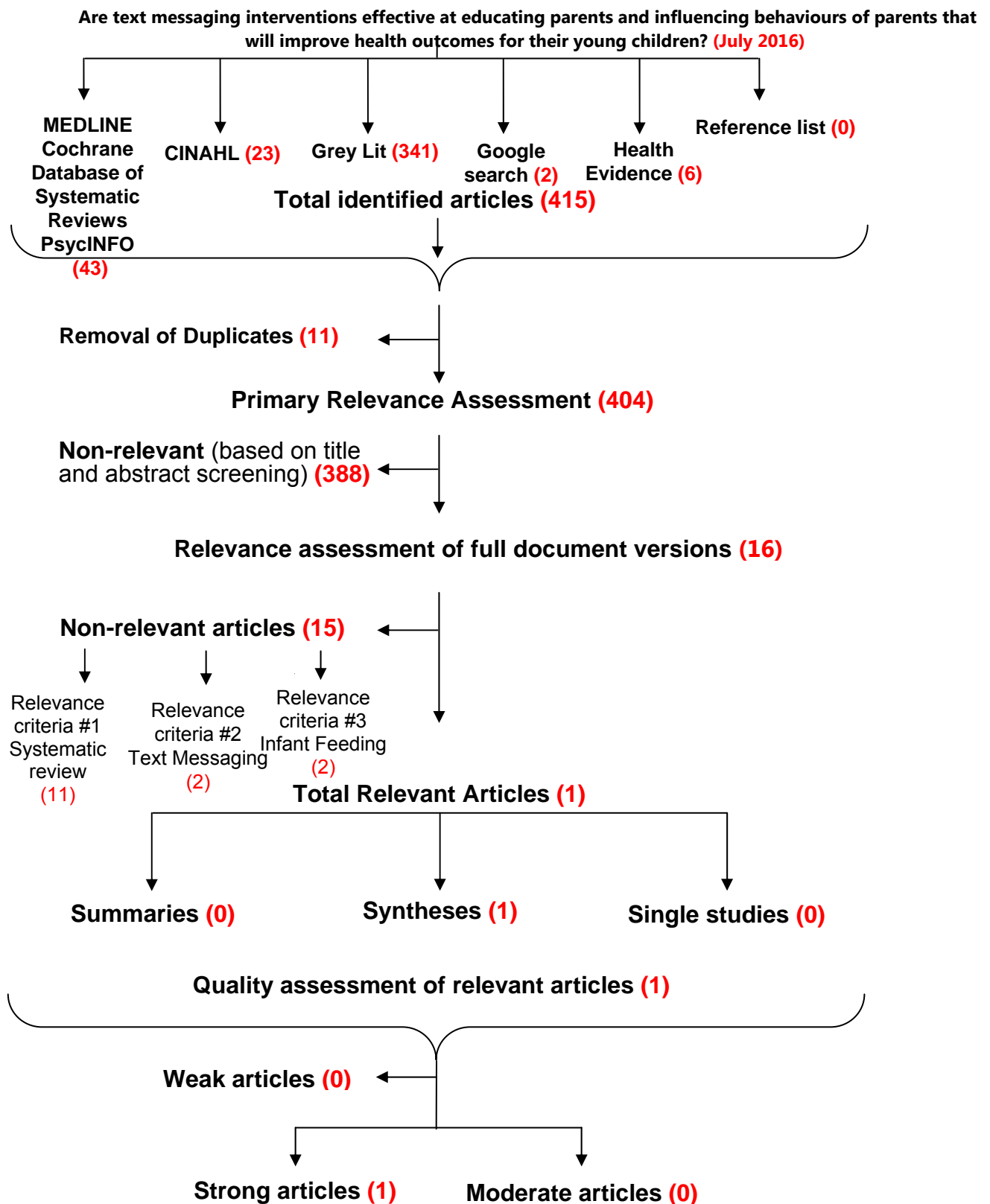
### Search #3 Single Studies

Database: EBM Reviews - Cochrane Database of Systematic Reviews <2005 to June 08, 2016>, Global Health <1973 to 2016 Week 21>, Ovid Healthstar <1966 to May 2016>, Ovid MEDLINE(R) <1946 to June Week 1 2016>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <June 08, 2016>, PsycINFO <2002 to June Week 1 2016>

Search Strategy:

- 
- 1 exp Cell Phones/ (15692)
  - 2 exp Text Messaging/ (2750)
  - 3 "texting".ti,ab. (1240)
  - 4 "text messag\*".ti,ab. (4997)
  - 5 exp Decision Making/ (361440)
  - 6 exp Attitude to Health/ (687026)
  - 7 exp Health Behavior/ (275153)
  - 8 exp Child Behavior/ (32866)
  - 9 "behav\*".ti,ab. (1976591)
  - 10 exp Motivation/ (286431)
  - 11 exp Choice Behavior/ (99637)
  - 12 exp Feeding Behavior/ (220201)
  - 13 ("theory" adj2 "planned behav\*").mp. [mp=ti, ab, tx, kw, ct, ot, bt, hw, id, cc, nm, kf, px, rx, ui, tc, tm] (7840)
  - 14 exp Parents/ (245807)
  - 15 exp Parenting/ (67017)
  - 16 exp Mother-Child Relations/ (46931)
  - 17 exp Parent-Child Relations/ (129174)
  - 18 exp Mothers/ (105814)
  - 19 "mother\*".ti,ab. (393392)
  - 20 exp Fathers/ (20695)
  - 21 "breastfe\*".ti,ab. (46526)
  - 22 exp Breast Feeding/ (72916)
  - 23 exp Infant Nutritional Physiological Phenomena/ (79471)
  - 24 "feed\*".ti,ab. (582560)
  - 25 "nutrition\*".ti,ab. (488905)
  - 26 "complementary".ti,ab. (181123)
  - 27 exp Child Nutritional Physiological Phenomena/ (93264)
  - 28 1 or 2 or 3 or 4 (18792)
  - 29 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 (3244314)
  - 30 14 or 15 or 16 or 17 or 18 or 19 or 20 (626025)
  - 31 21 or 22 or 23 or 24 or 25 or 26 or 27 (1260927)
  - 32 28 and 29 and 30 and 31 (47)
  - 33 limit 32 to (english language and yr="2009 -Current") [Limit not valid in CDSR; records were retained] (44)
  - 34 remove duplicates from 33 (21)

## Appendix B: Literature Search Flowchart



## Appendix C: Data Extraction Tables

Items Reviewed	Review - Effectiveness of mHealth interventions for maternal, newborn and child health in low- and middle income countries: Systematic review and meta-analysis
<b>General Information and Quality Rating</b>	
Author(s) and Date	Lee, S.H., Nurmatov, U.B., Nwaru, M.M., Grant, L., and Pagliarai, C. (June 2016)
Country	England
Quality Rating	Health Evidence Quality Assessment Tool – Review Articles: Overall rating: 10 (High quality), by two reviewers, recommended for use
Objectives of the Review	To assess the effectiveness of mHealth interventions for maternal, newborn and child health (MNCH) in low- and middle-income countries (LMIC).
<b>Details of Review</b>	
Primary Studies Included	15 research articles and two conference abstracts met inclusion criteria, including 12 intervention and three observational studies.
Search Period	Searches were limited to articles published between January 1990 and May 2014, acknowledging the emergence of digital cellular networks in the early 1990s.
Databases searched	16 Databases: Cochrane Library (Cochrane database of Systematic Reviews, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane methodology of register), MEDLINE, EMBASE, CINAHL, PsycINFO, AMED, Global health, TRIP, ISI Web of Science (Science and Social Science Index), WHO Global Health Library, IndMed, PakMediNet, KoreaMed, NHS Health Technology Assessment Database, African Index Medicus (encompassed in the WHO Global Health Library), POPLINE Clinical trials registry for on-going studies and trial protocols: WHO International Clinical trials Registry platform, Clinical trials.gov, Controlled-trials.com, Australian New Zealand Clinical Trials Registry Reference tracking: References lists of all included studies
Inclusion/Exclusion Criteria	Included: Women in the antenatal, intranatal, and postnatal periods; newborns; children aged 0-5 years; and health workers through which interventions aimed at these groups are mediated. Included studies evaluating interventions delivered through mobile ICT and considered the various delivery modes through which this might be achieved in low- and middle-income countries.

	<p>Excluded: Men, non-pregnant women or those not recently having given birth, and children over the age of 5 years. Excluded related ICT-based interventions delivered via fixed line internet or standard telephone line, interventions labeled 'mobile' which did not involve cellphones, such as Mobile Maternal Health Clinics which are touring buses staffed by health care professionals.</p> <p>Primary outcomes were estimates of maternal, newborn and child mortality and morbidity. Secondary outcomes included number of planned antenatal and postnatal visits; number of unscheduled care visits and emergency care; quality of life; quality of care (delivery by skilled birth attendants, appropriate use of evidence-based medical and obstetric interventions); self-efficacy; cost-effectiveness; immunisation cover; child developmental milestones; and other process indicators.</p>			
<b>Relevant Findings</b>				
	<p><i>Mobile delivery media:</i>          Mobile phones with SMS (n = 11)          SMS and voice messaging (n=1)          Voice calls (n=1)          MP3 audio recordings (n=1)          Mobile applications to collect data (n=2)</p>			
<i>Effects by Relevant Outcome in single Studies: Infant Feeding</i>				
Flax et al. (2014) Pregnant women aged between 15-45 y Total N = 461 Country: Nigeria	<b>Outcome of Interest</b>	<b>Breastfeeding (BF) learning sessions and SMS and songs/dramas</b>	<b>none of these (routine care)</b>	<b>Odds Ratio (95% CI)</b> SD = Significant difference NSD = No significant difference
	Exclusive BF at 1 month	73%	61%	1.6 (0.6-1.8) NSD
	Exclusive BF at 3 months	71%	58%	1.8 (1.1-3.0) SD
	Exclusive BF at 6 months	64%	43%	2.4 (1.4 – 4.0) SD
	Initiated BF within 1 h of delivery	70%	48%	2.6 (1.6-4.1) SD
	Gave only colostrum/breast	86%	71%	2.6 (1.4-5.0) SD

	milk during the first 3 d				
Jiang et al (2014) Population: Pregnant women (N=582) at <13 weeks gestation (n=) (n=) Country: China	Outcome of Interest	Intervention – SMS group	Control – Routine prenatal care		Odds Ratio (95% CI) SD = Significant difference NSD = No significant difference
	Exclusive BF at 4 months	46.4%	39.9%		1.4 (1.0-2.0) NSD
	Exclusive BF at 6 months	15.1%	6.3%		2.7 (1.5-4.9) SD
	BF at 12 months	20.2%	19.2%		1.0 (0.7-1.6) NSD
	Introduction of solid foods before 4 months	1.5%	3.8%		0.3(0.1-0.9) NSD
	Introduction of solid foods before 6 months	67.5%	61.3%		1.3(0.9-1.8) NSD
	Drinking from a cup at 12 months	53.6%	46.5%		1.3 (0.9-2.0) NSD
	Receiving food as a reward	45.5%	33.6%		1.5 (1.0-2.3) NSD
Taking a bottle to bed	51.9%	49.8%		1.1(0.7-1.6) NSD	
Sellen et al. (2013) Pregnant women from late pregnancy - 3rd trimester (32-36 weeks) to 3 months postpartum N = 530 Country: Kenya		Continuous cell phone based peer support (CPS)	Monthly peer support group (PSG)	Standard of care (SOC)	P-value Odds Ratio (95% CI) SD = Significant difference NSD = No significant difference
	BF initiated within 1 h	73.0%	70.2%	67.2%	P = 0.519; OR for CPS vs SOC 1.32 (95% CI 0.82–2.12) NSD
	Onset of lactation >3days	10.3%	8.9%	11.2%	P = 0.764; OR for CPS vs SOC 1.09 (95% CI 0.55–2.19) NSD
	Exclusive BF at 3 months	90.8%	82.8%	78.2%	CPS vs SOC: 90.9%vs 78.2% (Chi–

					square 9.8201, P = 0.0017) SD  CPS vs PSG: 90.9%vs 82.8% (P = 0.032) SD  OR for CPS vs SOC 2.77 (95% CI 1.44– 5.32) SD
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Summary:  
 Meta-analysis  
 A meta-analysis of the effect of SMS/cell phone vs routine prenatal care on the initiation of breastfeeding within one hour after birth, giving colostrum or breast milk within three days after birth, and EBF at three/four months, and at six months. The pooled estimates showed that the rates of initiating breastfeeding within one hour after birth (OR 2.01, 95% CI 1.27–2.75,  $I^2=80.9%$ ) were significantly higher in the groups given a SMS/cell phone prenatal intervention than in groups not given the SMS/cell phone intervention.  
 The evidence for giving colostrum or breast milk within three days after birth was not strong (OR 1.90, 95% CI 0.86–2.94,  $I^2=77.0%$  no significant difference).  
 The rates of EBF for three/four months (OR 1.88, 95% CI 1.26–2.50,  $I^2=52.8%$ ) and EBF for six months (OR 2.58, 95% CI 1.44–3.71,  $I^2=0.0%$ ) were also significantly higher in the groups given a SMS/cell phone prenatal intervention than in groups not given the SMS/cell phone intervention.