

Spring 2018

The Effect of Lactation Consultation on the Duration of Breastfeeding in New Mothers: A Systematic Review

Jillian Leiter

The University of Akron, jrl108@zips.uakron.edu

Jennifer Naegeli

The University of Akron, jln50@zips.uakron.edu

Lilyana Walkley

The University of Akron, law110@zips.uakron.edu

Please take a moment to share how this work helps you [through this survey](#). Your feedback will be important as we plan further development of our repository.

Follow this and additional works at: http://ideaexchange.uakron.edu/honors_research_projects

 Part of the [Maternal, Child Health and Neonatal Nursing Commons](#)

Recommended Citation

Leiter, Jillian; Naegeli, Jennifer; and Walkley, Lilyana, "The Effect of Lactation Consultation on the Duration of Breastfeeding in New Mothers: A Systematic Review" (2018). *Honors Research Projects*. 720.

http://ideaexchange.uakron.edu/honors_research_projects/720

This Honors Research Project is brought to you for free and open access by The Dr. Gary B. and Pamela S. Williams Honors College at IdeaExchange@UAKron, the institutional repository of The University of Akron in Akron, Ohio, USA. It has been accepted for inclusion in Honors Research Projects by an authorized administrator of IdeaExchange@UAKron. For more information, please contact mjon@uakron.edu, uapress@uakron.edu.

The Effect of Lactation Consultation on the Duration of Breastfeeding in New Mothers

A Systematic Review

Jillian Leiter, Jennifer Naegeli, Lilyana Walkley

The University of Akron

Author Note

Jillian Leiter, Jennifer Naegeli, & Lilyana Walkley, College of Nursing, The University of Akron, This paper is in fulfillment for the course: Honors Research Project 8200:480, Due April 27th, 2018.

Abstract

In the United States, 3.978 million babies were born in the year 2015 (U.S. Department of Health & Human Services, 2016). Statistics show that less than 25% of newborns in the United States are breastfed for half of the recommended time by The American Academy of Pediatrics. There are many benefits to breastfeeding, but babies are not receiving these benefits. This systematic review identifies, reviews, and critically appraises the evidence regarding the effect of lactation consultation on duration of breastfeeding in new mothers. Literature was retrieved from CINAHL and Google Scholar. Each study was vetted based on criteria to fully describe the current state of the science. The researchers from the studies reported mixed results. Most studies found that lactation consultants do increase the duration of breastfeeding, while other studies claimed the results were not significant enough to make a definite conclusion.

The common problem found with breastfeeding mothers is that they do not breastfeed their babies long enough based on health recommendations. The American Academy of Pediatrics (AAP) recommends mothers breastfeed their children for at least 12 months, and the World Health Organization recommends breastfeeding for even longer, up to 2 years of age and beyond (U.S. Department of Health and Human Services, 2016). Per the U.S. Department of Health and Human Services (2016), 81% of newborns start out being breastfed, but at the age of 6 months, only 22% are still being breastfed. This is a problem because when babies are not breastfed long enough, they are not getting the full benefits of breast milk and may not be as healthy as the babies who are breastfed for longer durations (Alder & DiMaggio, 2016).

Breastfeeding has positive consequences for both mothers and the babies. The benefits of breastfeeding for babies include increased immunity from antibodies in the breast milk, adequate nutrients to grow and develop, decreased health problems such as ear infections, allergies, eczema, stomach problems and respiratory infections, decreased incidence of Sudden Infant Death Syndrome, and decreased likelihood of obesity and diabetes as children grow and develop (Alder & DiMaggio, 2016). For mothers, breastfeeding increases mother-baby bonding, increases weight loss after pregnancy, and lowers risk of breast and ovarian cancers, diabetes, and osteoporosis (Alder & DiMaggio, 2016). Therefore, breastfeeding has the potential to improve the health of both mother and baby.

Some mothers who do decide to breastfeed experience difficulties. Studies have indicated that many health professionals providing care to mothers and infants are inadequately prepared

to provide prenatal education, perinatal support and postpartum follow-up for breastfeeding women, suggesting the need for lactation consultants (Wambach, Campbell, Gill, Dodgson, Abiona & Heinig, 2005). Lactation consultants talk with and help instruct new mothers on the proper techniques for breastfeeding before, during and after childbirth. Often, the information the lactation consultant provides during the prenatal period can influence a mother's feeding choice. They are also trained to provide clinical management of complex problems with lactation.

Lactation consultants are key providers of lactation care and management for breastfeeding mothers, with the goal to teach mothers how to properly breastfeed and provide positive reinforcement. This may in turn encourage mothers to breastfeed for the recommended amounts of time and ensure mothers and babies both receive all the benefits breast milk has to offer. Since healthcare professionals practice based on evidence from research, this leads to the question: In new mothers, how do lactation consultations, compared with no lactation consultations, affect the duration of breastfeeding? This systematic review was conducted to identify, review, and critically appraise the evidence about the effect of lactation consultation on duration of breastfeeding in new mothers.

Based on the analysis, practice and research recommendations will be advanced. The variables in the systematic review included the duration of time in which mothers breastfeeds, the dependent variable, and lactation consultation, the independent variable. This review is relevant to nursing because it is a nurses' professional obligation and scope of practice to not only provide education and support to breastfeeding mothers, but to also recognize the need for

breastfeeding help and refer their patient to nurses who are International Board Certified Lactation Consultants (IBCLC). IBCLCs are candidates who underwent academic programs including 90 hours of didactic education on human lactation and breastfeeding and 300 hours of directly supervised clinical practice in lactation management (Webber & Watkins, 2017). In addition to the academic programs, IBCLCs must pass the certification exam administered by the International Board of Lactation Consultant Examiners (Webber & Watkins, 2017). By using IBCLCs as resource support for nurses and also using their knowledge to encourage patients to breastfeed, breastfeeding goals can be met. Healthy People 2020 set a goal that 81.9% of infants be breastfed in the early postpartum period, with continued breastfeeding to 6 months for 60.6% of infants (U.S. Department of Health & Human Services, 2014). With IBCLCs and nurses working together to achieve the goals set by Healthy People 2020, the health of mothers and their infants will increase and, in turn, help promote population health in the United States.

Methods

The search for and selection of relevant research publications answering the PICO question were important steps of preparing and writing the systematic review. It was pertinent that the publications were primary sources, recent studies, and studies with sound methodologies that were published in credible sources of information. The keywords used in CINAHL, the nursing research database, as well as Google Scholar, to find relevant publications were 'breastfeeding', 'lactation consultant' and 'duration of breastfeeding'. Publications were selected

based on certain criteria. The inclusion criteria involved the research population of new mothers, the independent variable or intervention being the lactation consultant and the dependent variable being the amount of time mothers breastfed and the successfulness of the breastfeeding. The time period of the study had to be within the recommended amount of time mothers should breastfeed and there had to be a clear conclusion or results. Other inclusion criteria were publication in a peer-reviewed, academic or health related journal, primary sources, and appropriate experimental designs. Exclusion criteria included not having the full text and not being related to nursing care.

The research publications were critically evaluated to ensure they met inclusion and exclusion criteria, and included methods to decrease bias. Publications were selected to show variation and inconsistencies in outcomes and the state of the science. The goal was to pick research publications that were credible, reliable and comprehensive of our topic. This goal was achieved by using publications from a variety of journals, time periods, experimental designs, and outcomes. Some research studies showed that lactation consultants increased the duration of time mothers breastfed and some research studies concluded that lactation consultations have no effect, or even a negative effect, on duration of time babies were breastfed. Including studies with both positive and negative outcomes not only made this review comprehensive, but also helped the student researchers to avoid bias in their systematic review. Although the students' beliefs are that lactation consultants increase duration of time in which mothers breastfeed, the students purposely chose research publications with findings contrary to their beliefs to show inconsistencies of findings and to answer their PICO question. The selection methods of research

publications were critical to pick sources of good quality that can be trusted to give accurate results for the systematic review.

Review of Literature

When researchers have studied the effect of lactation consultation on duration of breastfeeding, they have reported mixed results. Although most of the researchers concluded that lactation consultants increased duration of breastfeeding (Bonuck, Stuebe, Barnett, Labbok, Fletcher & Bernstein, 2014; Bonuck, Freeman & Trombley, 2006; Bonuck, Trombley, Freeman & McKee, 2005; Carlsen, Kyhnaeb, Renault, Cortes, Michaelsen & Pryds, 2013; Castrucci, Hoover, Lim & Maus, 2006; Castrucci, Hoover, Lim & Maus, 2007; Jonsdottir, Fewtrell, Gunnlaugsson, Kleinman, Hibberd, Jonsdottir & Thorsdottir, 2014; Mattar, Chong, Chan, Chew, Tan, Chan & Rauff, 2007; Meedya, Fahy, Yoxall & Parratt, 2014; Merten, Dratva & Ackermann-Liebrich, 2005; Porter-Lewallen, Dick, Flowers, Powell, Taylor-Zickefoose, Wall, & Price, 2006; Rishel & Sweeny, 2005; Rosen, Krueger, Carney, & Graham, 2008; Su, Chong, Chan, Chan, Fok, Tun, Ng & Rauff, 2007; Wambach, Aaronson, Breedlove, Domian, Rojjanasrirat & Yeh, 2011; Wouk, Chetwynd, Vitaglione & Sullivan, 2017), some found no effect on duration (Kools, Thijs, Kester, van den Brandt & de Vries, 2005; Lynch, Koch, Hislop & Coldman, 1986; Pinelli, Atkinson & Saigal, 2001; Tahir & Al-Sadat, 2013).

All studies used lactation consultation interventions in which lactation consultants had contact with or worked with the new moms - whether it was face-to-face (Bonuck et al., 2005;

Bonuck et al., 2014; Bonuck et al., 2006; Castrucci et al., 2006; Castrucci et al., 2007; Jonsdottir et al., 2014; Kools et al., 2005; Lynch et al., 1986; Mattar et al., 2007; Meedya et al., 2014; Merten et al., 2005; Pinelli et al., 2001; Porter-Lewallen et al., 2006; Rishel & Sweeney, 2005; Rosen et al., 2008; Su et al., 2007; Wambach et al., 2011), in provider offices (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Jonsdottir et al., 2014; Kools et al., 2005; Rishel & Sweeney, 2005; Rosen et al., 2008; Su et al., 2007; Wambach et al., 2011), at hospitals (Bonuck et al., 2005; Bonuck et al., 2006; Castrucci et al., 2006; Castrucci et al., 2007; Jonsdottir et al., 2014; Kools et al., 2005; Lynch et al., 1986; Mattar et al., 2007; Merten et al., 2005; Pinelli et al., 2001; Porter-Lewallen et al., 2006; Rishel & Sweeney, 2005; Su et al., 2007; Wambach et al., 2011), at home (Bonuck et al., 2005; Bonuck et al., 2006; Jonsdottir et al., 2014; Kools et al., 2005; Porter-Lewallen et al., 2006), or over the phone (Bonuck et al., 2005; Bonuck et al., 2006; Carlsen et al., 2013; Jonsdottir et al., 2014; Kools et al., 2005; Meedya et al., 2014; Porter-Lewallen et al., 2006; Su et al., 2007; Tahir & Al-Sadat, 2013). A majority of the researchers used face-to-face contact in either hospitals or providers' offices. The time frame for duration of breastfeeding was six months (Bonuck et al., 2014; Carlsen et al., 2013; Jonsdottir et al., 2014; Kools et al., 2005; Lynch et al., 1986; Mattar et al., 2007; Meedya et al., 2014; Merten et al., 2005; Pinelli et al., 2001; Rishel & Sweeney, 2005; Rosen et al., 2008; Su et al., 2007; Tahir & Al-Sadat, 2013), with the exceptions of Bonuck et al., (2005;2006), who examined outcomes more than six months, Wambach et al., (2011) who examined outcomes at four weeks, Porter-

Lewallen et al. (2006) at eight weeks and Castrucci et al. (2006), Castrucci et al. (2007), and Merten et al. (2005), who examined outcomes at hospital discharge.

Most studies took place in either the United States (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Carlsen et al., 2013; Castrucci et al., 2006; Castrucci et al., 2007; Habibi, Springer, Spence, Hansen-Petrik & Kavanagh, 2017; Porter-Lewallen et al., 2006; Rishel & Sweeney, 2005; Rosen et al., 2008; Torres, 2014; Wambach et al., 2011; Wouk et al., 2017) or Canada (Pinelli et al., 2001), but there were some that took place in other countries: Malaysia (Tahir & Al-Sadat, 2013), Iceland (Jonsdottir et al., 2014), China (Mattar et al., 2007; Su et al., 2007), Netherlands (Kools et al., 2005), Australia (Meedya et al., 2014) and Switzerland (Merten et al., 2005). Research designs were randomized, controlled trials (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Carlsen et al., 2013; Jonsdottir et al., 2014; Kools et al., 2005; Mattar et al., 2007; Pinelli et al., 2001; Su et al., 2007; Wambach et al., 2011), but there were studies that utilized qualitative designs (Habibi et al., 2017; Merten et al., 2005; Porter-Lewallen et al., 2006), non-experimental retrospective designs (Rishel & Sweeney, 2005; Rosen et al., 2008; Wouk et al., 2017) or quasi-experimental study (Meedya et al., 2014). The randomized, controlled trials were at Level 2 for the levels of evidence pyramid. The qualitative, retrospective and quasi-experimental designs were not as high on the evidence pyramid; they were commonly at a Level 4 or 6 for evidence. Sample sizes varied depending on the design and type of study. A majority of the sample sizes for the randomized controlled trials were in the 200s (Bonuck et al., 2014; Carlsen et al., 2013; Lynch et al., 1986) and 300s or more (Bonuck et al., 2005; Bonuck et

al., 2006; Kools et al., 2005; Mattar et al., 2007; Su et al., 2007; Tahir & Al-Sadat, 2013; Wambach et al., 2011). The qualitative designs had sample sizes in the hundreds (Porter-Lewallen et al., 2006), the retrospective designs had anywhere from hundreds to thousands of subjects (Habibi et al., 2017; Rishel & Sweeney, 2005; Rosen et al., 2008; Wouk et al., 2017) and the quasi-experimental design had a sample size in the 300s (Meedya et al., 2014). There were several limitations of findings across studies. Almost all of the studies were limited by sample sizes being too specific to be able to generalize the results across the entire population. Other limitations included that many of the sampling procedures were convenience or voluntary and based on self-reporting, so social desirability bias could have affected the results. Further, mothers with higher motivation to breastfeed may have been more likely to participate in the studies. Gaps in knowledge across studies included how women who decided they did not want to breastfeed were affected by lactation consultation, if they would end up breastfeeding, and if so, how long they would breastfeed. Most of the studies reviewed did not consider any mothers who stopped breastfeeding or did not breastfeed at all.

There were numerous research publications that concluded that lactation consultation increased the duration of breastfeeding (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Carlsen et al., 2013; Castrucci et al., 2006; Castrucci et al., 2007; Jonsdottir et al., 2014; Mattar et al., 2007; Meedya et al., 2014; Merten et al., 2005; Porter-Lewallen et al., 2006; Rishel & Sweeney, 2005; Rosen et al., 2008; Su et al., 2007; Wambach et al., 2011). Several of these studies found that interacting with a lactation consultant prenatally and immediately after birth

until discharged from the hospital, was enough to make a difference and result in the mothers breastfeeding longer (Castrucci et al., 2006; Castrucci et al., 2007; Mattar et al., 2007; Merten et al., 2005; Rosen et al., 2008). Other researchers found that women are more likely to breastfeed for extended periods of time when offered unlimited access to a lactation consultant or meeting with a lactation consultant both prenatally, in the hospital and postnatally (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Jonsdottir et al., 2014; Meedya et al., 2014; Porter-Lewallen et al., 2006; Rishel & Sweeney, 2005; Su et al., 2007; Wambach et al., 2011). Whether it was multiple meetings or only one meeting with a lactation consultant, the results from all of these studies support the theory that lactation consultation increases the duration of breastfeeding and support the overall use of lactation consultants.

On the other hand, there were a few studies finding no significant effects of lactation consultation on the duration of breastfeeding (Kools et al., 2005; Pinelli et al., 2001; Tahir & Al-Sadat, 2013). All of these studies still found that the experimental groups, or groups receiving consultation, has increased duration of breastfeeding, but the results were not significant enough to make a definite conclusion. Only one study, Kools et al. (2005), found the control group to have a higher amount of mothers continuing to breastfeed than the intervention group. Although the researchers did not conclude that lactation consultation increased duration of breastfeeding, they still recommended more use of lactation consultants in the future.

There were also research publications that did not directly examine the effect of lactation consultation on duration of breastfeeding (Habibi et al., 2017; Wouk et al., 2017). Wouk et al.

(2017), examined the effect of the amount of lactation consultants in certain areas on the breastfeeding rates. The study found that higher breastfeeding rates were associated with having more lactation consultants in an area (Wouk et al., 2017). The results of this study caused the researchers to conclude that breastfeeding support resources, or lactation consultants, are associated with increased breastfeeding. On the other hand, Habibi et al. (2017), found that the use of videoconferencing was accepted as a form of lactation consultant support. The study suggested that videoconferencing is an easy and cost effective way to expand lactation consultant services, and in return, help to increase the duration of breastfeeding. All of these discoveries are important in determining whether or not lactation consultation increases the duration of breastfeeding, which is important for the health of the infant.

Critical Appraisal of the

The findings of this systematic review are not without limitations. A major limitation is the lack of articles. Only 20 articles were reviewed and included due to lack of resources and time constraints on the student researchers regarding deadlines. CINAHL and Google Scholar were used to access articles, but often times the articles required a subscription to be viewed, making it a challenge to include all relevant articles in the systematic review. By using only published or readily available articles, the conclusions of the study may be unreliable.

Conversely, the findings may be bias towards good results because researchers are less likely to share bad results. There is also inevitable subjectivity in the screening of relevant articles when there is more than one student researcher involved because each member interprets inclusion

criteria differently. Inconsistencies in the research methodologies and data analysis make it difficult to compare studies and make conclusions. Another limitation of this systematic review was the low amount of articles published recently. New research and articles take a while to be published, making many of the research articles out of date. If there were no time constraints or deadlines, more articles could be gradually added into the review. Systematic reviews have a clear advantage over traditional literature reviews, but can be difficult to apply into practice.

The most common design method was randomized controlled trials (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Carlson et al., 2013; Jonsdottir et al., 2014; Mattar et al., 2007; Pinelli et al., 2001; Tahir & Al-Sadat, 2013; Wambach et al., 2011). This research methodology tends to be more analytical with findings as the studies use numbers and randomized groups to discover whether the intervention is successful or not. These studies commonly compare two groups, a control group and an interventional group, to determine the successfulness of the intervention, providing reliable information on the cause and effect of an intervention. Another common design method used across many of the studies was a qualitative design, such as interviews and open-ended questionnaires (Merten et al., 2005; Porter-Lewallen et al., 2006). Using a qualitative method can be informative on the opinions of the participants in a more individual standpoint as open-ended questionnaires offer more options for personal thoughts.

The next methods that are going to be discussed were seen less overall than the prior methods. Another method design used was a non-experimental method (Rishel & Sweeny, 2005;

Wouk et al., 2017). When non-experimental methods are used the researcher does not control the variable or subjects in the study; only interpretation, observation or interactions are used to come to a conclusion. As a result, these studies cannot be used to conclude that lactation consultants cause an increase in breastfeeding; they can only conclude that there is a relationship between the two. A cross sectional study design with an online survey was used in two of the studies included in the literature review (Castrucci et al., 2006; Habibi et al., 2017). This form of study is not as reliable as others because it is a voluntary convenience sample of women who were willing to submit to an online survey. The use of online surveys excludes populations who do not have internet access. On the other hand, the quasi-experimental design (Castrucci et al., 2007), tends to have similar processes as a random controlled trial but without the randomization. There are still two groups: one who receives the intervention and one who does not. This form of study can be very effective at showing results, but is less accurate than the random controlled trials, as the lack of randomization decreases the effectiveness by increasing the risk bias. The final study methodology used was retrospective cohort (Rosen et al., 2008). This method tends to be more reflective as the researchers are asking women how certain interventions helped them in the past, as opposed to observing the intervention in action. Because the researchers are asking women to remember their experiences from the past, the information shared may not be as reliable.

The methods and findings are quite reliable in the sense that the majority of the studies analyzed have shown similar results. Many studies have found that some form of contact with lactation consultants have increased the amount of women breastfeeding and increased the

duration of breastfeeding (Bonuck et al., 2005; Bonuck et al., 2006; Bonuck et al., 2014; Carlsen et al., 2013; Castrucci et al., 2006; Castrucci et al., 2007; Jonsdottir et al., 2014; Mattar et al., 2007; Merten et al., 2005; Porter-Lewallen et al., 2006; Rishel & Sweeny, 2005; Rosen et al., 2008; Wambach et al., 2011). There were a couple of studies which found no effect on the duration of breastfeeding (Pinelli et al., 2001; Tahir & Al-Sadat, 2013). Overall, the consensus was that lactation consultants increase the duration of breastfeeding.

Although this systematic review of 20 articles indicates a positive correlation between lactation consultation and duration of breastfeeding, it is important to note that there are numerous other studies that the researchers were not able to analyze.

A common limitation among many of the studies was an issue with the sample, whether it was size or level of diversity. Because of the nature of the topic, some studies were conducted in individual hospitals, therefore the size was inherently small (Porter-Lewallen et al., 2006; Buckley, 2009; Jonsdottir et al., 2014; Rishel et al., 2005; Pinelli et al., 2001). Also related to the nature of the topic was the way a sample was taken. Several studies reported using a convenience sample due to the ease of finding participants (Habibi, et al., 2017; Porter-Lewallen et al., 2006; Rishel et al., 2005). For others it was difficult to find a diverse group of participants, therefore generalizations could not be made regarding other populations. In one study, all of the women were low income black or hispanic, living in Bronx, New York (Bonuck et al., 2006), whereas in another, all of the participants were in the military (Rishel et al., 2005).

Another limitation found in multiple studies was that the participants self-reported, which could cause a decrease in accuracy of information as well as introduce the potential for bias (Wambach, et al., 2011; Bonuck et al., 2014; Johnsdottir et al., 2014). There were several types of bias discussed across several articles such as financial bias, recall bias and social desirability bias (Wambach, et al., 2011; Bonuck et al., 2014). One study offered an incentive of \$10- \$20, which could have caused financial bias, as well as recall bias due to the fact that the participants self reported (Wambach, et al., 2011). Social desirability bias was also brought up as a potential issue for women self reporting because they may answer the questions the way they perceive the researchers desire them to be answered (Bonuck et al., 2014). The question was raised in one study, whether increased duration of breastfeeding could have been attributed to the fact that women who already intended to breastfeed would go to a baby friendly hospital, and would be more willing to comply with all 10 steps of the program implemented, which could be a sampling bias (Merten et al., 2005).

The remaining limitations included women knowing they were going to be approached by lactation consultants, therefore possibly increasing their commitment to breastfeed (Carlson et al, 2013), as well as no face to face interaction and mothers not answering their phones for telephone lactation consultation (Tahir et al., 2013). Several participants dropped out of a study due to being transferred to another hospital and were replaced, however the study was unable to distinguish between those who strictly breastfed, and those who supplemented with formula (Rosen, 2008). A Canadian study reported all subjects breastfeeding whether they were in an

intervention group or not, therefore high rates in the control group could be due to the study being conducted in a more advantaged area (Pinelli et al., 2001). It is always important to discuss the limitations of studies to ascertain whether or not they are of value.

Synthesis of the Evidence

The results of this systematic review are that in 18 of 20 articles analyzed, interaction with a lactation consultant, or delivering in a hospital with an IBCLC available, showed an increase in breastfeeding duration. Those delivering in a hospital with an IBCLC also had increased initiation of breastfeeding (Castrucci et al., 2007). Majority of the studies only included mothers with uncomplicated pregnancies and deliveries (Bonuck et al., 2005; Bonuck et al., 2014; Carlson et al., 2013; Castrucci et al., 2006; Mattar et al., 2007; Meedya et al., 2014; Porter-Lewallen et al., 2006; Rosen et al., 2008; Su et al., 2007; Tahir & Al-Sadat, 2013), while a few studies only included mother-infant dyads in which the infant was admitted to the Neonatal Intensive Care Unit (Castrucci et al., 2007; Pinelli, Atkinson & Saigal, 2001). Mothers were from varying backgrounds and ethnicities such as non-Hispanic black, white, and Hispanic patients (Bonuck et al., 2005; Bonuck et al., 2006). Only a few studies exclusively included new mothers (Meedya et al., 2014; Wambach et al., 2011). Studies and participants were diverse in regional placement, coming from a low income neighborhood in the Bronx New York (Bonuck et al., 2007) as well as, but not limited to Switzerland (Merten et al., 2005), Iceland (Jonsdottir et al., 2014) and Malaysia (Tahir et al., 2013). Ten of twenty studies measured exclusivity related to breastfeeding (Meedya et al., 2014; Bonuck et al., 2006; Jonsdottir et al., 2014; Carlson et al.,

2013; Tahir et al., 2013; Merten et al., 2005; Bonuck et al., 2005; Bonuck et al., 2014; Su et al., 2007; Mattar et al., 2007), and seven of those ten reported increased exclusive breastfeeding from mothers who received lactation consultation in some form (Meedya et al., 2014; Jonsdottir et al., 2014; Carlson et al., 2013; Tahir et al., 2013; Bonuck et al., 2014; Su et al., 2007; Mattar et al., 2007). One of the studies (Porter-Lewallen et al., 2006), found that the most common reasons mothers quit breastfeeding included the perception of insufficient milk supply, painful nipples, latch problems, having to return to work, the mother having to go on medications and illness of either the mother or baby or both. Although almost all of the articles in this systematic review found that lactation consultants increase the duration of breastfeeding, it is important to consider all the variables that could affect the effectiveness of the lactation consultants, the duration of breastfeeding and the satisfaction of mothers and infants.

Recommendations

The results of these studies have given the researchers a couple of ideas regarding recommendations for the clinical practice. First, almost every single study that has been analyzed for this review has recommended the use of lactation consultation to encourage breastfeeding and assist the new mothers as they need it. It is recommended that all hospitals with postpartum units have an adequate number of IBCLCs to provide assistance with all aspects of breastfeeding to all postpartum mothers.

Second, the results of this systematic review has allowed the researchers to understand that the amount of instruction regarding breastfeeding is important, but also any little bit of education can increase the duration of breastfeeding in mothers. Some studies showed that just one class on breastfeeding can increase the duration, while other studies showed that numerous classes regarding the topic tend to yield better results regarding hitting the recommended 6 months exclusive breastfeeding. With this in mind, another recommendation would be to work with insurance companies to get them to cover the cost of a visit with an IBCLC prenatally, postpartum and post-discharge for all women who breastfeed.

In regards to advancing recommendations for future studies, there should be more research as to the effect of prenatal breastfeeding courses as compared to breastfeeding education during the postnatal period. Another topic that should be researched regarding breastfeeding education and lactation consultation is the effect of repeated classes versus one single course on breastfeeding.

References

- Alder, L.C., DiMaggio, J. (2016). Breastfeeding vs. formula feeding. *Medline Plus*. Retrieved from <https://medlineplus.gov/ency/patientinstructions/000803.htm>
- Bonuck, K., Stuebe, A., Barnett, J., Labbok, M. H., Fletcher, J., & Bernstein, P. S. (2014). Effect of primary care intervention on breastfeeding duration and intensity. *American Journal Of Public Health, 104*(S1), S119-27.
- Bonuck, K. A., Freeman, K. & Trombley, M. (2006). Randomized controlled trial of a prenatal and postnatal lactation consultant intervention on infant health care use. *Archives of Pediatrics & Adolescent Medicine, 160*, 953-960.
- Bonuck, K., Trombley, M., Freeman, K., & McKee, D. (2005). Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months. *Pediatrics, 116*(6), 1413-1426.
- Carlsen, E. M., Kyhnaeb, A., Renault, K. M., Cortes, D., Michaelsen, K. F. & Pryds, O. (2013). Telephone-based support prolongs breastfeeding duration in obese women: A randomized trial. *American Journal of Clinical Nutrition, 98*, 1226-32. doi: 10.3945/ajcn.113.059600
- Castrucci, B., Hoover, K., Lim, S., & Maus, K. (2007). Availability of lactation counseling services influences breastfeeding among infants admitted to neonatal intensive care units. *American Journal Of Health Promotion, 21*(5), 410-415.
- Castrucci, B., Hoover, K., Lim, S., & Maus, K. (2006). A comparison of breastfeeding rates in an urban birth cohort among women delivering infants at hospitals that employ and do not employ lactation consultants. *Journal Of Public Health Management & Practice, 12*(6), 578-585.

- Habibi, M. F., Springer, C. M., Spence, M. L., Hansen-Petrik, M. B., & Kavanagh, K. F. (2017). Use of Videoconferencing for Lactation Consultation: An Online Cross-Sectional Survey of Mothers' Acceptance in the United States. *Journal Of Human Lactation: Official Journal Of International Lactation Consultant Association*, 890334417711385. doi:10.1177/0890334417711385
- Jonsdottir, O. H., Fewtrell, M. S., Gunnlaugsson, G., Kleinman, R. E., Hibberd, P. L., Jonsdottir, J. M., & Thorsdottir, I. (2014). Initiation of complementary feeding and duration of total breastfeeding: Unlimited access to lactation consultants versus routine care at the well-baby clinics. *Breastfeeding Medicine*, 9196-202.
- Kools, E. J., Thijs, C., Kester, A. D. M., van de Brandt, P. & de Vries, H. (2005). A breastfeeding promotion and support program a randomized trial in the Netherlands. *Preventive Medicine*, 40, 60-70. Doi: 10.1016/j.ypmed.2004.05.013
- Mattar, C. N., Chong, Y. S., Chan, Y. S., Chew, A., Tan, P., Chan, Y. H. & Rauff, M. H. J. (2007). Simple antenatal preparation to improve breastfeeding practice: A randomized controlled trial. *The American College of Obstetricians and Gynecologists*, 109(1), 73-80.
- Meedya, S., Fahy, K., Yoxall, J. & Parratt, J. (2014). Increasing breastfeeding rates to six months among nulliparous women: A quasi-experimental design. *Midwifery*, 30(3), e137-e144. Doi: 10.1016/j.midw.2013.12.010
- Merten, S., Dratva, J., & Ackermann-Liebrich, U. (2005). Do baby-friendly hospitals influence breastfeeding duration on a national level? *Pediatrics*, 116(5), e702-8
- Pinelli, J., Atkinson, S., & Saigal, S. (2001). Randomized trial of breastfeeding support in very low-birth-weight infants. *Archives Of Pediatrics & Adolescent Medicine*, 155(5), 548-553.

- Porter-Lewallen, L., Dick, M. J., Flowers, J., Powell, W., Zickefoose, K. T., Wall, Y. G. & Price, Z. M. (2006). Breastfeeding support and early cessation. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 35, 166-172. Doi: 10.1111/J.1552-6909.2006.00031.x.
- Rishel, P. E. N. & Sweeney, P. (2005). Comparison of breastfeeding rates among women delivering infants in military treatment facilities with and without lactation consultants. *Military Medicine*, 170(5), 435-438.
- Rosen, I. M., Krueger, M. V., Carney, L. M. & Graham, J. A. (2008). Prenatal breastfeeding education and breastfeeding outcomes. *American Journal of Maternal Child Nursing*, 33(5), 315-319.
- Su, L. L., Chong, Y. S., Chan, Y. H., Chan, Y. S., Fok, D., Tun, K. T., Ng, F. S. P., & Rauff, M. (2007). Antenatal education and postnatal support strategies for improving rates of exclusive breast feeding: Randomised controlled trial. *British Medical Journal*, 335. doi: 10.1136/bmj.39279.656343.55
- Tahir, N. M., & Al-Sadat, N. (2013). Does telephone lactation counselling improve breastfeeding practices?: A randomised controlled trial. *International Journal Of Nursing Studies*, 50(1), 16-25.
- U.S. Department of Health & Human Services. (2016). Breastfeeding. *Centers for Disease Control and Prevention*. Retrieved from <http://www.cdc.gov/breastfeeding/index.htm>.
- U.S. Department of Health & Human Services. (2014). Maternal, infant and child health. *Healthy People 2020*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives>

U.S. Department of Health & Human Services. (2016). National center for health statistics.

Centers for Disease Control and Prevention. Retrieved from

<http://www.cdc.gov/nchs/products/databriefs/db258.htm>

Wambach, K. A., Aaronson, L., Breedlove, G., Domian, E. W., Rojjanasrirat, W., & Yeh, H.

(2011). A randomized controlled trial of breastfeeding support and education for

adolescent mothers. *Western Journal Of Nursing Research*, 33(4), 486-505.

Wambach, K., Campbell, S. H., Gill, S., Dodgson, J., Abiona, T. & Heinig, M. J. (2005). Clinical

lactation practice: 20 years of evidence. *Journal of Human Lactation*, 21, 245-258. Doi:

10.1177/0890334405279001

Webber, E. & Watkins, A. L. (2017). Evolution of a profession: The role of accreditation in

lactation education. *Journal of Human Lactation*, 33(4), 740-744. Doi:

10.1177/0890334417711893

Wouk, K., Chetwynd, E., Vitaglione, T. & Sullivan, C. (2017). Improving access to medical

lactation support and counseling: Building the case for medicaid reimbursement.

Maternal and Child Health Journal, 21, 836-844. Doi: 10.1007/s10995-016-2175-x.

Systematic Review Table of Evidence

APA formatted reference	Purpose statement. Research question.	Clinical Practice Setting, Sampling methods, Sample size.	Design. Level of Evidence	Findings, Conclusion	Practice & Research Implications	Limitations of Findings
1: Porter-Lewallen, L., Dick, M., Flowers, J., Powell, W., Taylor-Zickefoose, K., Wall, Y., & Price, Z. (2006). Breastfeeding support and early cessation. <i>Journal of Obstetric, Gynecologic, & Neonatal Nursing</i> , 35, 166-172.	<p>Purpose Statement: "The purpose of this study was to examine the types of help women received with breastfeeding both in the hospital and at home and reasons why women stopped breastfeeding earlier than intended."</p> <p>Research Question: the researchers wanted to discover what kind of help women received with breastfeeding when they expressed an intention to breastfeed for at least 8 weeks, and to compare reasons for failing to meet their breastfeeding goals.</p>	<p>Setting: southeastern United States</p> <p>Sampling Method: women were interviewed in their hospital rooms after having healthy term deliveries and then called after 8 weeks to answer questions about their breastfeeding experience.</p> <p>Sample Size: 391 women intending to breastfeed for at least 8 weeks, only successfully reached 379 women at 8 weeks.</p>	<p>Design: qualitative data interviews</p> <p>Level of Evidence: Level 6</p>	<p>The researchers found that the majority of the women were still breastfeeding at 8 weeks, with some supplementing with formula. Almost all of the women reported having help with breastfeeding at the hospital. The great majority of those being helped by lactation consultants. Only about half of the women received help with breastfeeding after discharge, mostly by lactation consultants.</p> <p>The most common reasons for quitting breastfeeding were the perception of insufficient milk supply, painful nipples and latch problems, returning to work, medications for mother, and illness for mother or baby.</p>	<p>Verbal and written information about signs that the baby is receiving enough nutrition should be given to the mother while in the hospital. Nurses and lactation consultants should take the opportunity to observe feedings while in the hospital. Family members should be included in prenatal and postnatal education.</p>	<p>The study used a convenience sample, therefore generalizations cannot be made to other populations such as lesser-educated women. The results of this study could have been affected by the strong lactation support in the hospitals studied.</p>
2: Meedy, S., Fahy, K., Yoxall, J., & Parratt, J. (2014). Increasing breastfeeding rates to six months among nulliparous women: A quasi-experimental study. <i>Midwifery</i> , 30(3), e137-e144. doi:10.1016/j.midw.2013.12.010	<p>Purpose Statement: the aim of this study was to evaluate the effectiveness of a multiphased midwifery intervention called the 'Milky Way' on any breastfeeding rates until six months</p>	<p>Setting: a tertiary, metropolitan hospital in Sydney, Australia</p> <p>Sampling method: nulliparous women who were greater than 19 years old and</p>	<p>Design: a quasi-experimental study with two groups: standard care and intervention</p> <p>Level of</p>	<p>The Milky Way program, which was comprised of group sessions, take home learning activities, and postnatal telephone consultations, increased the 6 month exclusive breastfeeding rate from</p>	<p>The researchers of this study recommend the Milky Way program to increase the exclusive breastfeeding rate at 6 months. They also recommend further research into this</p>	<p>The main limitation of this study was that it was non-randomized. In addition, the primary researcher was not blind to the study group assignments, which could be a limitation</p>

	Research question: Is the Milky Way educational intervention effective in increasing the rates of any breastfeeding up to six months postpartum?	intended to breastfeed were invited Sample size: 355 women	Evidence: Level 3	31.4% to 54.3%.	program to fully determine the effectiveness of it.	for this study.
3: Kools, E. J., Thijs, C., Kester, A. D. M., van de Brandt, P. & de Vries, H. (2004). A breast-feeding promotion and support program a randomized trial in the Netherlands. <i>Preventive Medicine</i> , 40, 60-70. doi: 10.1016/j.ypmed.2004.05.013	Purpose Statement: "To examine the effectiveness of a breastfeeding promotion program in increasing the continuation of breastfeeding." Research question: Will a breastfeeding promotion program increase the duration of breastfeeding?	Setting: 10 child health care centers in the province of Limburg, the most southern province of the Netherlands Sampling Method: Pregnant mothers who applied for home health care in the intervention or usual care regions were enrolled and were followed up from pregnancy until 6 months postpartum Sample size: 683 pregnant mothers	Design: cluster-randomized intervention trial Level of Evidence: Level 2	The study found no significant differences between the intervention and control groups in the rates of breastfeeding at birth, or 3 months, or later. Therefore, the program was not effective. Availability of free lactation consultation was not shown to make a difference in breastfeeding continuation in spite of its high uptake in the intervention group.	Recommendations for practice include looking for points of improvement in their program. Further research should look for the proper mix and intensity of interventions to increase the duration of breastfeeding. Other improvements for breastfeeding support may include a combination of attention to behavioral determinants at the caregivers' level and environmental and cultural change.	This study could have been limited due to the variability in the child health care centers and the caregivers/lactation consultants. The results could also have been altered because the caregivers could not be blinded for the intervention, causing the outcome measurement to possibly be influenced by social desirability or by expectation about the intervention effect.
4: Bonuck, K. A., Freeman, K. & Trombly, M. (2006). Randomized controlled trial of a prenatal and postnatal lactation consultant intervention on infant health care use. <i>Archives of Pediatrics & Adolescent Medicine</i> , 160, 953-960.	Purpose Statement: The purpose of this study is "to determine whether infants of women randomized to a prenatal and postpartum lactation support intervention increase their duration of breastfeeding and incur fewer otitis media, respiratory tract or gastrointestinal-related visits than controls"	Setting: Two urban community health centers in Bronx, New York Sampling Method: Eligible, consenting women were randomized by a research assistant. Randomization used an undisclosed blocking factor, stratified by center,	Design: Randomized Controlled Trial Level of Evidence: Level 2	The results showed that intervention group women were breastfeeding significantly more than than the control group at 2 weeks. The intervention group was significantly more likely to breastfeed at each week, up to and including week 20. Group differences were for 50% or more breastmilk, but not for	Providing prenatal and postnatal interventions by a lactation consultant will help to increase breastfeeding amount and duration. These interventions must be feasible in practice, but enough to significantly increase breastfeeding intensity if they are to demonstrably affect infant health.	This study is limited because it focuses only on low-income, Hispanic and/or black mother-infant dyads. It is hard to generalize the results to include other mother-infant dyads such as high-income and caucasians. It is also limited because the study was conducted in only one same area in Bronx, New York.

	Research Question: Will prenatal and postnatal lactation consultant interventions increase the duration of breastfeeding and decrease doctor visits due to otitis media, respiratory tract or gastrointestinal problems?	with sealed, coded envelopes. Sample Size: 338 low-income, primarily Hispanic and/or black mother-infant dyads (n=163 for the intervention group and n=175 for control group)		exclusive breastfeeding. Visits for any illnesses did not differ by treatment group.		
5: Jonsdottir, O. H., Fewtrell, M. S., Gunnlaugsson, G., Kleinman, R. E., Hibberd, P. L., Jonsdottir, J. M., & ... Thorsdottir, I. (2014). Initiation of complementary feeding and duration of total breastfeeding: unlimited access to lactation consultants versus routine care at the well-baby clinics. <i>Breastfeeding Medicine</i> , 9(196-202). doi:10.1089/bfm.2013.0094	Purpose Statement: "the aim of the present study was to assess the effect of unlimited access to lactation consultants on complementary feeding from 5 to 6 months for infants receiving complementary foods from 4 months of age in addition to breastmilk and their effect on total breastfeeding duration." (p 197) Research question: Will unlimited access to lactation consultants or routine care that well baby clinics have greater effect on the initiation of complementary feeding and duration of total breastfeeding?	Setting: Iceland (7 healthcare centers and well-baby clinics) Sampling method: The groups were randomly selected from patients at the well baby clinics and those with access to lactation consultants. They were then randomly selected into the 4 month or 6 month group. Sample size: The sample was 50 mother-baby pairs that had access to lactation consultants unlimitedly, and 28 mother-infant pairs that were treated in a well baby clinic that at the age of 4 months they started to receive complimentary food along with the breastmilk. The other group of sample	Design: This study was made of 2 studies: one was a randomized controlled trial and the other was a national prospective cohort study Level of Evidence: Level 2	The results show that mothers with unlimited access to lactation consultants are slower to introduce complementary foods to their infants than their counterparts who were treated at the well-baby clinic. Also, infants who were exclusively breastfed for 6 months have a longer total breastfeeding duration than those who were introduced to complementary foods at age 4 months. This is regardless of where they were treated.	It is recommended that mothers exclusively breastfeed their infants until 6 months old and then start to introduce complementary foods as to encourage the mother and the infant to meet the goals put out by the World Health Organization and the American Academy of Pediatrics.	Much of this study was dependent on self-report of the foods fed to the infant. This makes a limitation due to the risk of error in the self-reporting. Also the sample size was somewhat small compared to some other studies.

		members were 50 mother-baby pairs that had unlimited access to lactation consultants and 15 that were treated at a well baby clinic were exclusively breastfed for 6 months.				
6: Wouk, K., Chetwynd, E., Vitaglione, T. & Sullivan, C. (2017). Improving access to medical lactation support and counseling: Building the case for medicaid reimbursement. <i>Maternal and Child Health Journal</i> , 21, 836-844. doi: 10.1007/s10995-016-2175-x	<p>Purpose Statement: "To explore the availability of lactation providers, their association with breastfeeding outcomes and the cost-effectiveness of this model."</p> <p>Research Question: Will geographic regions with a higher density of International Board Certified Lactation Consultants have a higher prevalence of breastfeeding at 6 weeks among low-income infants?</p>	<p>Setting: North Carolina maternity centers</p> <p>Sampling Method: De-identified data from the Pediatric Nutrition Surveillance System was requested for public health visits by low-income infants and children (aged 0-5 years) who participate in federally funded maternal and child health programs.</p> <p>Sample Size: 11,338 infants</p>	<p>Design: Non Experimental, retrospective</p> <p>Level of Evidence: Level 4</p>	As the density of International Board Certified Lactation Consultants increases, the crude prevalence of any breastfeeding at 6 weeks trends upward. In general, higher breastfeeding rates were associated with having more than zero International Board Certified Lactation Consultants in an infant's county of residence. The findings also indicated that breastfeeding support resources are available regionally across North Carolina.	There should be equity in access to lactation support. The study suggests that states should assemble and analyze data in support of International Certified Lactation Consultants reimbursement for any form of lactation support and counselling. The analyses can advocate for consistent reimbursement policies to improve equity in access to lactation services and reduce breastfeeding disparities.	A limitation of this study is the lack of data on specific locations where International Certified Lactation Consultants practice, as the zip code locations were self-reported at the time of their credentialing. As a result, the addressed could be invalid for lactation consultants who have moved or ceased working.
7: Carlson, E. M., Kyhnaeb, A., Renault, K. M., Cortes, D., Michaelson, K. F. & Pryds, O. (2013). Telephone-based support prolongs breastfeeding duration in obese women: a randomized trial. <i>The American Journal of Clinical Nutrition</i> , 98, 1226-32. doi: 10.3945/ajcn.113.059600	<p>Purpose Statement: "To evaluate whether telephone-based support could increase the duration of breastfeeding in obese women and, thereby, reduce offspring growth."</p> <p>Research Question: Will</p>	<p>Setting: Hvidovre Hospital at Copenhagen University in Denmark</p> <p>Sampling Method: Mothers who intended to breastfeed and had no history of breast</p>	<p>Design: Randomized controlled trial</p> <p>Level of Evidence: Level 2</p>	The study showed a marked effect of breastfeeding intervention in obese women. Telephone-based support increased the duration of both exclusive and partial breastfeeding rates considerably during the first 6 months postpartum. Although	The findings recommend that telephone lactation consultant support should be used as an intervention to improve both exclusive and partial breastfeeding duration. They suggest that additional research is needed to	This study could have been limited because the participants knew that they would be approached, which may have increased their commitment to breastfeeding. The study may have also been affected by the fact that there was no face-to-face contact

	<p>telephone support by an International Board Certified Lactation Consultant extend the exclusive and partial breastfeeding duration in obese women and affect infant's 6 month anthropometric measurements?</p>	<p>surgery were recruited from the Treatment of Obese Pregnant study. The women were randomly assigned to 6 months of breastfeeding or standard standard care controls. At 6 months, there were 207 dyads in the study; 105 dyads received support, and 102 dyads were control subjects.</p> <p>Sample Size: 226 dyads of obese mothers and their singleton, healthy, term infant</p>		<p>the duration of exclusive breastfeeding was inversely associated with infant weight and infant length at 6 months, the breastfeeding support group did not achieve a significant effect on on infant growth at 6 months.</p>	<p>reveal the pathogenesis behind the obstacles obese women encounter in breastfeeding.</p>	<p>between the mothers and lactation consultants. It is hard to generalize the study because the sample size was small and only included obese women with one healthy, term infant.</p>
<p>8: Tahir, N. M., & Al-Sadat, N. (2013). Does telephone lactation counselling improve breastfeeding practices?: A randomised controlled trial. <i>International Journal Of Nursing Studies</i>, 50(1), 16-25. doi:10.1016/j.ijnurstu.2012.09.006</p>	<p>Purpose Statement: To determine the effectiveness of telephone-based lactation counselling in encouraging exclusive breastfeeding for at least 6 months among mothers who delivered in a public hospital.</p> <p>Research question Will a different approach to counselling intervention by the lactation consultants help new mothers be better equipped with knowledge and support to continue breastfeeding?</p>	<p>Setting: public hospital (Maternity Hospital Kuala Lumpur) in Malaysia</p> <p>Sampling method: A postnatal ward list of mothers was screened for those who match the criteria. If they matched the criteria they were informed on the study and personally invited to join. Only those who gave consent were recruited into the study.</p> <p>Sample size:</p>	<p>Design: Nonequivalent-groups posttest-only design</p> <p>Level of Evidence: Level 2</p>	<p>Telephone lactation counselling given by registered nurses who were certified as lactation counselors was effective in increasing the exclusive breastfeeding rate at the first month postpartum, but was not effective at the fourth and six months postpartum.</p>	<p>The findings recommend that telephone lactation counselling be considered as one of many strategies used to improve exclusive breastfeeding rates among mothers. They suggest further studies be created involving multiple methods of postnatal support aiming to increase exclusive breastfeeding.</p>	<p>If the intervention was properly received relied on the mothers - some did not answer the phone, did not call back or declined the support. The intervention also lacked effectiveness because there was no face-to-face interactions between the mothers and the lactation consultants. The study could have also been limited because the counselors providing the intervention did it on a part-time basis, in addition to their primary nursing jobs.</p>

		357 subjects				
9: Habibi, M. F., Springer, C. M., Spence, M. L., Hansen-Petrik, M. B., & Kavanagh, K. F. (2017). Use of Videoconferencing for Lactation Consultation: An Online Cross-Sectional Survey of Mothers' Acceptance in the United States. <i>Journal Of Human Lactation: Official Journal Of International Lactation Consultant Association</i> , 890334417711385. doi:10.1177/0890334417711385	<p>Purpose Statement: " the aim of this study was to evaluate the relationship between acceptance of VCLS and (a) demographic factors, (b) technology acceptance subscales, (c) learning style preferences, and (d) other potentially explanatory maternal factors among mothers of infants \leq 4 months of age."</p> <p>Research Question: The researchers wanted to determine the effectiveness of videoconferencing as a method of lactation consultation for new mothers</p>	<p>Setting: Online survey in the United States across randomly selected states</p> <p>Sampling Method: Mothers were recruited from an array of social media sites and parenting groups.</p> <p>Sample Size: 100 mothers who were at least 18 years of age, had an infant less than 4 months old, had breastfed at least once, had access to the internet and a valid e-mail address.</p>	<p>Design:cross-sectional study using online survey, convenience sample</p> <p>Level of Evidence: Level 4</p>	<p>This study indicated an overall acceptance of videoconferencing lactation consultations as a form of lactation support.</p>	<p>This study showed that e-medicine and videoconferencing is becoming a more accepted practice in this age. There should be continued research on this topic as more research could determine what forms of lactation consultation or e-medicine in general is going to be the most successful and helpful for the patients.</p>	<p>One limitation of this study is that the sample represented mostly one population, older white mothers. The method of getting participants was a convenience sample, therefore the population is not truly representative of the whole population.</p>
10: Merten, S., Dratva, J., & Ackermann-Liebrich, U. (2005). Do baby-friendly hospitals influence breastfeeding duration on a national level?. <i>Pediatrics</i> , 116(5), e702-8.	<p>Purpose Statement: This study reports results of a national study of the prevalence and duration of breastfeeding in 2003 throughout Switzerland and analyzes the influence of compliance with UNICEF guidelines of the hospital where delivery took place on breastfeeding duration.</p> <p>Research question Does compliance with UNICEF guidelines in</p>	<p>Setting: Switzerland</p> <p>Sampling method: random sample of mothers who had given birth in the past 9 months in Switzerland between April and September 2003</p> <p>Sample size: 3032</p>	<p>Design: qualitative</p> <p>Level of Evidence: Level 6</p>	<p>Infants born in baby-friendly hospitals were more likely to be breastfed for a longer time than were those born in non-baby-friendly facilities.</p>	<p>Even though there was an improvement in breastfeeding duration, there was still not enough exclusive breastfeeding which is recommended for the baby's first 6 months. Continued research and encouragement and education of mothers should be performed.</p>	<p>A possible limitation is that differences in breastfeeding duration may be attributable to the fact that mothers who intended to breastfeed longer would choose to give birth in a baby-friendly hospital and that these mothers would be more willing to comply with the recommendations of the 10 steps program.</p>

	hospitals (baby friendly) affect the prevalence and duration of breastfeeding?					
11: Bonuck, K., Trombley, M., Freeman, K., & McKee, D. (2005). Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months. <i>Pediatrics</i> , 116(6), 1413-1426.	<p>Purpose Statement: To determine whether an individualized, prenatal, and postnatal, lactation consultant intervention resulted in increased cumulative intensity of breastfeeding up to 52 weeks.</p> <p>Research question In low-income hispanic or black mothers, does access to a prenatal and postnatal lactation consultation result in increased intensity of breastfeeding up to 52 weeks?</p>	<p>Setting: Two community health centers serving low-income, primarily Hispanic and/or black women in Bronx, New York</p> <p>Sampling method: Random sampling of prenatal care patients at 2 hospital affiliated health centers in the Bronx from August 2000- November 2002.</p> <p>Sample size: 382 subjects</p>	<p>Design: Randomized, non-blinded, controlled trial.</p> <p>Level of Evidence: Level 2</p>	<p>Findings/Conclusion: The intervention group was more likely to continue breastfeeding through week twenty, however, exclusive breastfeeding rates were low among those in the control and non-control groups.</p>	<p>Lactation consultants attempted 2 prenatal meetings, a postpartum hospital visit, and/or home visits and telephone calls. Control subjects received standard of care. This intervention increased breastfeeding intensity and duration and promotion should focus on exclusive breastfeeding.</p>	<p>This intervention did not target exclusivity. Lactation consultants were hampered by their "consultant" title and routine hospital and clinic presence would give greater access to hard to reach populations. The interventions success would likely be increased by encouragement from the prenatal care provider.</p>
12: Bonuck, K., Stuebe, A., Barnett, J., Lobbok, M. H., Fletcher, J., & Bernstein, P. S. (2014). Effect of primary care intervention on breastfeeding duration and intensity. <i>American Journal Of Public Health</i> , 104(S1), S119-27. doi:10.2105/AJPH.2013.301360	<p>Purpose Statement: To determine the effectiveness of primary care-based, and pre and postnatal interventions to increase breastfeeding.</p> <p>Research question: Will pre- and postnatal visits with a lactation consultant, compared to usual care, increase breastfeeding intensity?</p>	<p>Setting: Obstetrics and gynecology practices in Bronx, New York</p> <p>Sampling method: Research assistants recruited women during routine prenatal care</p> <p>Sample size: 275 Women</p>	<p>Design: randomized controlled trial</p> <p>Level of Evidence: Level 2</p>	<p>The intervention group had significantly higher rates of breastfeeding at 1, 3, 6 months and exclusive breastfeeding at 1 and 3 months than the group receiving usual care.</p>	<p>A professional lactation consultant intervention helps increase exclusive and high intensity breastfeeding. Scheduled and ongoing visits with a lactation consultant should be integrated into routine, providing support continuously rather than only when the women actively seek help. Incorporating routine home visits might also increase intervention effectiveness. Further studies should be conducted to test</p>	<p>The study was limited because the outcomes were measured by maternal self-report, so social desirability bias might have affected the results. All breastfeeding interventions also relied on maternal self-report. Additionally, the study samples were not necessarily representative of the U.S. population of childbearing age women, so it is hard to generalize the results of the study.</p>

					whether peer counsellors could achieve similar results using the lactation consultant protocols.	
13: Su, L. L., Chong, Y. S., Chan, Y. H., Chan, Y. S., Fok, D., Tun, K. T., Ng, F. S. P. & Rauff, M. (2007). Antenatal education and postnatal support strategies for improving rates of exclusive breastfeeding: Randomised controlled trial. <i>British Medical Journal</i> , 335. doi: 10.1136/bmj.39279.656343.55	<p>Purpose Statement: "To investigate whether antenatal breastfeeding education alone or postnatal lactation support alone improves rates of exclusive breastfeeding rates compared with routine hospital care."</p> <p>Research question: Will antenatal breastfeeding education and a postnatal lactation support protocol improve the rates of exclusive breastfeeding in a tertiary hospital setting?</p>	<p>Setting: Tertiary hospital in Singapore (China)</p> <p>Sampling method: Healthy pregnant women who were attending antenatal clinic at the National University Hospital were recruited by an experience lactation consultant</p> <p>Sample size: 450 women with uncomplicated pregnancies</p>	<p>Design: Randomized controlled trial</p> <p>Level of Evidence: Level 2</p>	<p>Compared with women who received routine care, women in the postnatal support group were more likely to breastfeed exclusively at two weeks, six weeks, three months and six months. Antenatal breastfeeding education and postnatal lactation support both significantly improve rates of exclusive breastfeeding up to six months after delivery. Postnatal support was marginally more effective than antenatal education.</p>	<p>Pregnant mothers should be provided with both antenatal and postnatal interventions in addition to the routine ambulatory and inpatient hospital care in order to help increase the rates of exclusive breastfeeding. This should be generalized to any setting where women's pregnancy and delivery are managed in a hospital setting.</p>	<p>This study had several limitations. One reason the study was limited was because most of the women in the study did not attend the antenatal classes offered by the hospital. The findings of this study are limited because they may not be applicable in settings where the baseline breastfeeding practice is better. Another limitation was due to the study not being powered to study the difference in the breastfeeding practice among the different ethnic groups.</p>
14: Mattar, C. N., Chong, Y. S., Chan, Y. S., Chew, A., Tan, P., Chan, Y. H. & Rauff, M. H. J. (2007). Simple antenatal preparation to improve breastfeeding practice. <i>The American College of Obstetricians and Gynecologists</i> , 109(1), 73-80.	<p>Purpose Statement: "To address the impact of simple antenatal educational interventions on breastfeeding practice."</p> <p>Research question: Will antenatal educational interventions increase the duration of breastfeeding in women with low-risk pregnancies and term</p>	<p>Setting: National University Hospital in Singapore (China)</p> <p>Sampling Method: A random sample of eligible, low-risk antenatal patients were recruited from clinics in the National University Hospital</p>	<p>Design: Randomized controlled trial</p> <p>Level of Evidence: Level 2</p>	<p>Group A, which received breastfeeding educational material and individual coaching from a lactation consultant, practiced exclusive and predominant breastfeeding more often than mothers receiving educational material alone (Group B) or routine antenatal care (Group C) at 3 and 6 months. When comparing the breastfeeding rates of</p>	<p>This study suggests that a simple, one-encounter antenatal education and counselling by a lactation consultant should be used to significantly improve breastfeeding practice up to 6 months after delivery. The study also suggests that provisions of printed or audiovisual educational material is not enough and healthcare workers</p>	<p>One limitation was the absence of block randomization. Block randomization would have ensured the same number of participants in each group. The authors also admit that the study is limited because of the small sample size. Contamination between groups was not strictly prevented, causing women in the control group to know about the</p>

	deliveries?	Sample size: 401 women; 123 in Group A, 132 in Group B and 146 in Group C		Groups B and C, they found no significant difference in breastfeeding rates at any interval.	should make every effort to have one face-to-face encounter to discuss breastfeeding with expectant mothers before they deliver.	interventions offered to the other groups, which could have affected the outcomes.
15: Wambach, K. A., Aaronson, L., Breedlove, G., Domian, E. W., Rojjanasirat, W., & Yeh, H. (2011). A randomized controlled trial of breastfeeding support and education for adolescent mothers. <i>Western Journal Of Nursing Research</i> , 33(4), 486-505. doi:10.1177/0193945910380408	Purpose Statement: To test the hypotheses that education and counseling interventions provided by a lactation consultant, would increase breastfeeding initiation and duration up to 6 months postpartum, when compared to control conditions. Research question In middle adolescent first time mothers, does intervention from a lactation consultant increase breastfeeding intensity and duration?	Setting: Four prenatal clinics in a bi-state metropolitan area in the Midwestern United States. Over the course of the study, three additional clinics and four high school settings were added. Sampling method: Participants were between the ages of 15 and 18 and were in the second trimester of pregnancy with their first child, able to speak and read English, and access to a telephone. Sample size: 390 subjects	Design: Prospective, non-blinded, three group randomized controlled trial Level of Evidence: Level 2	Findings/Conclusion: The chi square test indicated significant association between the experimental intervention and breastfeeding initiation. Breastfeeding duration was found to be significantly longer in the experimental group vs the control groups.	Intervention/ Implications: Lactation consultants and peer counselors performed prenatal, in-hospital, and postnatal education and support, through 4 weeks postpartum. They also co-taught 2 prenatal classes and peer counselors called the participants before and after Class 1 and after Class 2 to provide ongoing information. The interventions were found to increase initiation and duration of breastfeeding, therefore, these interventions should be incorporated into care.	Limitations included reliance on self reports, bias due to financial incentive of \$10-\$20. There was also potential for recall bias related to self report in those participants who were not reached exactly at designated postpartum data collection points.
16: Rishel, P.E. & Sweeny, P. (2005). Comparison of breastfeeding rates among women delivering infants in military treatment facilities with and without lactation consultants. <i>Military Medicine</i> , 170(5), 435-438.	Purpose Statement: "To compare breastfeeding rates in the early postpartum period, at 4 months, and at 6 months among women delivering infants in military medical treatment facilities (MTFs) with or without a lactation consultant (LC) available on staff."	Setting: 2 Air Force MTFs and one Navy MTF. Sampling Method: retrospective chart review of all infants born in these 3 MTFs during the specified time frame. Researchers recorded	Design: Non-experimental, retrospective Level of Evidence: Level 4	Women who delivered at MTF that had a lactation consultant were more likely to be breastfeeding at the time of discharge, as 84% of women were breastfeeding at that time. Both facilities with a lactation consultant met the <i>Healthy People 2010</i> goal of 75% of women	This study enhances the fact that having a lactation consultant increases the percentage of women breastfeeding at the time of discharge.	The limitations of this study were the small sample size and the use of only military members for this study. The use of only military members makes it harder to generalize the findings to the entire population.

	<p>Research Question: Researchers wanted to determine if lactation consultants increase the long-term breastfeeding rates in women on military bases.</p>	<p>the number who were breastfeeding at 4 and 6 months.</p> <p>Sample Size: 507 deliveries at these 3 MTFs.</p>		<p>breastfeeding in the early postpartum period. All three facilities fell short of meeting the <i>Healthy People 2010</i> goal for continuing breastfeeding for 6 months at 50%.</p>		
<p>17: Castrucci, B., Hoover, K., Lim, S., & Maus, K. (2007). Availability of lactation counseling services influences breastfeeding among infants admitted to neonatal intensive care units. <i>American Journal Of Health Promotion</i>, 21(5), 410-415.</p>	<p>Purpose Statement: To assess the association between the presence of international, board certified lactation consultant (IBCLC) services at a delivery hospital and the breastfeeding practices of women whose infants required neonatal intensive care unit (NICU) admission.</p> <p>Research question: Does the presence of an IBCLC affect the breastfeeding practices of women whose baby is in the NICU?</p>	<p>Setting: 7 delivery facilities in Philadelphia, Pennsylvania</p> <p>Sampling method: Random sampling of birth certificates from 2003-2004 limited to mother, infant pairs in which the infant was admitted to the NICU.</p> <p>Sample size: 2132 subjects</p>	<p>Design: quasi-experimental</p> <p>Level of Evidence: Level 3</p>	<p>Breastfeeding rates among mothers who delivered in a hospital with an IBCLC breastfed 50% of the time, compared to women who delivered in a hospital without an IBCLC at 36.9%. Initiation of breastfeeding was also higher among women who delivered in a hospital with an IBCLC.</p>	<p>This study adds to the evidence base that having an IBCLC present at a delivery facility increases the chance of breastfeeding in the NICU, and in this study it was by 34%.</p>	<p>A limitation of this study was that while delivering in a hospital with an IBCLC was associated with higher initiation of breastfeeding, it is unclear if this increase was due to contact with the IBCLC or if it was due to staff, policy, or organizational attitude toward breastfeeding due to the presence of an IBCLC, or another unknown factor.</p>
<p>18: Castrucci, B., Hoover, K., Lim, S., & Maus, K. (2006). A comparison of breastfeeding rates in an urban birth cohort among women delivering infants at hospitals that employ and do not employ lactation consultants. <i>Journal Of Public Health Management & Practice</i>, 12(6), 578-585.</p>	<p>Purpose Statement: To compare rates of breastfeeding at hospital discharge between facilities that employ and do not employ International Board Certified Lactation Consultants and determine whether the number of hours worked annually by International Board Certified Lactation Consultants</p>	<p>Setting: Philadelphia, Pennsylvania</p> <p>Sampling method: birth certificate data provided by the Pennsylvania Department of Health was analyzed for the correct data needed</p> <p>Sample size: 11,525 cases</p>	<p>Design: cross-sectional design, correlational design</p> <p>Level of Evidence: Level 4</p>	<p>Delivering at a facility where an International Board Certified Lactation Consultant was present was associated with an increase in the rate of breastfeeding at hospital discharge among all groups. The largest difference in the rate of breastfeeding at hospital discharge was found among women using</p>	<p>Widespread use of International Board Certified Lactation Consultants is encouraged. Further research is needed to understand the within-facility activities and operations of International Board Certified Lactation Consultants and to investigate the causal nature of this</p>	<p>There is significant limitations to the study due to the use of birth record data and the interfacility variation in data collection methods. A limitation in regards to the International Board Certified Lactation Consultants was that the amount of actual contact between the women and the</p>

	<p>was associated with breastfeeding at hospital discharge.</p> <p>Research question: Do hospitals that employ International Board Certified Lactation Consultants have higher breastfeeding rates at discharge compared to hospitals that do not employ International Board Certified Lactation Consultants? Is the number of hours worked annually by International Board Certified Lactation Consultants associated with breastfeeding rates at discharge?</p>			<p>Medicaid. Also, breastfeeding at hospital discharge was consistently higher among women who delivered at facilities with more International Board Certified Lactation Consultant hours worked than deliveries.</p>	<p>relationship.</p>	<p>consultant was not recorded or included. The increased rates of breastfeeding cannot be positively associated with individual contact with consultants, from a change on staff, organizational attitude towards breastfeeding and/or some unknown or unmeasured factors. In addition, the presence of an International Board Certified Lactation Consultant may be a marker of pre existing breastfeeding-friendly staff</p>
<p>19: Pinelli, J., Atkinson, S., & Saigal, S. (2001). Randomized trial of breastfeeding support in very low-birth-weight infants. <i>Archives Of Pediatrics & Adolescent Medicine</i>, 155(5), 548-553.</p>	<p>Purpose Statement: To determine if supplementary structured breastfeeding counselling for both parents compared with conventional hospital breastfeeding support improves the duration of breastfeeding in very low-birth-weight infants up to 1 year old.</p> <p>Research question: Does supplementary structured breastfeeding counseling for both parents, compared to conventional hospital breastfeeding support, improve the duration of</p>	<p>Setting: A tertiary-level neonatal intensive care unit in central-west Ontario, Canada</p> <p>Sampling method: infants with birth weights less than 1500g who were born in the hospital or transferred with their mother within 72 hours of birth who were going to be fed mother's milk by choice were approached by a research assistant to participate in the study</p>	<p>Design: Randomized trial with longitudinal follow-up</p> <p>Level of Evidence: Level 2</p>	<p>The mean duration of breastfeeding was 26.2 weeks for the group who received supplementary structured breastfeeding counselling and 24.2 weeks for the group who received the normal, hospital breastfeeding support. Although the intervention group overall breastfed longer, the results were not significantly different.</p>	<p>Although the results of the study were not significant, the researchers still suggest that supporting parents of preterm infants is important to breastfeeding success. Further studies should be conducted to determine the effectiveness of lactation consultants in more disadvantaged populations and for those with limited access to community resources.</p>	<p>One main limitation to this study involved the fact that all of the subjects were determined to breastfeed, whether they were in the intervention group or not, so the high rates of breastfeeding in the control group could also be due to the fact it was in a relatively advantaged population and there was good availability of breastfeeding resources. It is also limited because it involved a limited population of only</p>

	breastfeeding in very low-birth-weight infants up to 1 year old?	Sample size: 128 infants (& parents)				very low-birth-weight infants who were already planning to breastfeed.
20: Rosen, I.M., Krueger, M.V., Carney, L.M., & Graham, J.A. (2008). Prenatal breastfeeding education and breastfeeding outcomes. American Journal of Maternal Child Nursing, 33(5), 315-319.	<p>Purpose Statement: "To examine the impact of various breastfeeding outcomes of 3 cohorts receiving different methods of prenatal breastfeeding education"</p> <p>Research Question: the researchers are wondering which form of prenatal education on breastfeeding is more successful, a one-time class, or a once weekly class.</p>	<p>Setting: Army Medical center breastfeeding classes</p> <p>Sampling Method: voluntary participants from each group, and volunteers who did not attend a class.</p> <p>Sample Size: 194 mothers, 60 in control group, 75 in one-time teaching, and 59 in weekly group.</p>	<p>Design: A retrospective cohort design</p> <p>Level of Evidence: Level 4</p>	This study showed that there as not very much of a difference between the groups regarding the initiation of breastfeeding, but there was a substantial difference, 43% compared with 67% in the mothers continuing to breastfeed 6 months out.	This study helps to show the importance of breastfeeding education since even a one-time class can increase the rates of initiation and continuation of breastfeeding for the mother.	There were several limitations to this study. Several participants dropped out of this study due to being transferred and were replaced with other participants. Also, the design of this study cannot determine causality, only association. This study was also unable to distinguish between those who strictly breastfeed and those who supplemented with formula.