

Peer Intervention Strategies for Breastfeeding Promotion Among Low Income Latinas in
the US: A Literature Review

A Senior Project
presented to
the Faculty of the Food Science and Nutrition Department
California Polytechnic State University, San Luis Obispo

In Partial Fulfillment
of the Requirements for the Degree of
Bachelor of Science in Nutrition

by
Amanda Torres
December, 2011

© 2011 Amanda Torres

Abstract

Background: Significant economic, maternal, and infant benefits are associated with breastfeeding. US breastfeeding rates remain low, particularly among low income and minority groups. Latinos, the largest and fastest growing minority population in the US, have lower breastfeeding rates than other groups. Evidence suggests peer interventions successfully promote breastfeeding. The purpose of this review was to evaluate the effectiveness of breastfeeding peer interventions among low income Latinas in the US.

Methods: Internet databases such as PubMed were searched including, but not limited to, the following terms: Hispanic, Latino, breastfeeding, low income, peer, educators, counseling, and intervention. There were no restrictions on years searched.

Results: The five studies reviewed demonstrated consistently higher breastfeeding rates among peer intervention groups compared to controls. All studies had a component of prenatal breastfeeding education, postpartum follow-up, and a minimum of one home visit. The two studies focusing on exclusive breastfeeding showed 12.0 to 24.3 percentage points higher rates for intervention groups than controls. The three studies focusing on breastfeeding initiation and duration showed 13.0 to 45.0 percentage points higher breastfeeding initiation among intervention groups. Duration measurement varied from one to six months, but rates were consistently higher among intervention groups.

Conclusion: The literature supports the notion that peer-interventions among low income Latinas positively affect breastfeeding rates. These findings are consistent with peer interventions performed in other countries which successfully increased breastfeeding rates. Further research is needed to support these findings and explore implementation strategies for peer-based breastfeeding promotion programs to increase breastfeeding rates and its associated benefits.

Introduction

History

Historically breastfeeding was as common as natural birth and alternative methods of infant feeding were not readily available. Roughly around the mid 1950's an increase of new infant food products, greater availability of cow's milk, and the direction of physicians led to a decrease in breastfeeding rates (Apple, 1980), which remained staggeringly low until about 2001. The lowest recorded rate of breastfeeding was in 1971 when only 3.2% were exclusively breastfeeding at six months. Before 2001, the highest rates of exclusive breastfeeding at six months were observed in 1982, at 19.8%, before a

decline in the rates until about 1990. Since 2001, there has been a steady increase in exclusive breastfeeding until six months from 10.4% to 17.2% between 1990 and 2001, as seen in Figure 1 below (Ryan, Wenjun, & Acosta, 2002). In 2006, exclusive breastfeeding rates at six months were 14.1% and 43.5% of infants were “ever breastfed” at six months (U.S. Department of Health Human Services [USDHHS], 2011).

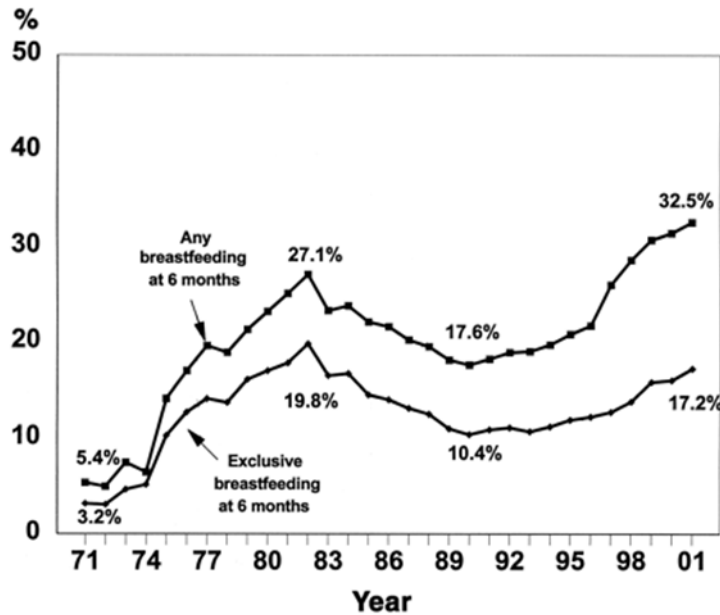


Figure 1. “Any” and “exclusive” breastfeeding rates at six months of age: 1971-2001, US data. Ryan et al. (2002).

Goals and Rates

The World Health Organization (World Health Organization [WHO], 2002) and UNICEF recommend that all infants be exclusively breastfed until six months of age (WHO & UNICEF, 1989). US national objectives aim for about 81% of women to initiate any breastfeeding and 60% to continue until six months (USDHHS, 2011). US breastfeeding rates have slowly increased as seen by 2010 rates of 75% of “ever breastfed” and 43% breastfed at six months. However, rates for exclusive breastfeeding at six months have declined since 2001 from 17.2% to 13.3% in 2010 (Center for Disease

Control and Prevention [CDC], 2010; Ryan et al., 2002). In addition, significant disparities exist between US socio-demographic groups. The Latino population, which is the largest and fastest growing minority group in the US, is a key example. (Center for Disease Control and Prevention [CDC], 2007a).

Benefits

Breastfeeding is critical because of the numerous health benefits to mother (American Academy of Pediatrics Work Group on Breastfeeding, 1997), infant (World Health Organization [WHO], 2000), and society (Hanson et al., 1991). These benefits to maternal and offspring health associated with breastfeeding have been well established (Kramer & Kakuma, 2004) and include decreased infant mortality and decreased morbidity from infectious diseases (WHO, 2000). In addition to the health benefits, significant individual and population-level economic benefits can be attributed to breastfeeding (Hanson et al., 1991).

Interventions

There is a need to evaluate interventions which successfully encourage breastfeeding and thereby promote the numerous associated health and economic benefits among the growing Latina population. Research in other countries, including Mexico, has shown peer education to positively affect breastfeeding initiation, duration, and exclusivity rates (Morrow et al., 1999; Dennis, Hodnett, Gallop, & Chalmers, 2002). The US has yet to thoroughly explore an effective breastfeeding intervention among this population. Therefore, the purpose of this literature review is to evaluate the effectiveness of breastfeeding peer interventions among low income Latina women in the US.

Background

Benefits of Breastfeeding

Infant benefits. Exclusive breastfeeding for the first six months of life has been established as the ideal nutrition support for optimum growth and development of the infant (American Academy of Pediatrics Work Group on Breastfeeding, 1997). Some of the many infant health benefits that support these recommendations include decreased gastrointestinal problems (Ho, Glass, & Pinsky, 1988), improved cognitive development (Mortensen, Michaelsen, Sanders, & Reinisch, 2002; Morrow-Tlucak, Haude, & Ernhart, 1988), fewer ear infections (Mortensen et al., 2002), lower risk for obesity, and lower risk for type II diabetes (Horta, Martines, & Victoria, 2007). Wheezing illnesses are five times more likely to occur in children who received minimal breastfeeding and shared a room in contrast to infants exposed to only one of these risk factors (Mortensen et al., 2002). According to the Mental Developmental Index of the Bayley Scale, infants that are breastfed for at least four months showed greater cognitive development (Morrow-Tlucak et al., 1988). A systematic literature review compared the long term protective effects of breastfeeding and other public health intervention targets such as diet and exercise. This review found a 37% decreased likelihood for breastfed infants to be diabetic (type II) later in life; these results were reflective of other interventions. The review also found that breastfed infants had a 22% decreased likelihood of becoming obese later in life; although not all studies showed this same effect (Horta et al., 2007). Lower rates of ear infections, fewer rates of gastrointestinal related health issues, improved cognitive development, and decreased risk of diabetes type II and obesity are various benefits that make breastfeeding ideal for infant nourishment. Breastfeeding is

not only associated with improved infant health, but also has significant benefits for maternal outcomes.

Maternal benefits. Lactation and breastfeeding have benefits for maternal health including lactational amenorrhea and increased uterus involution, a more rapid return to pre-pregnancy weight, and decreased post-menopausal hip fractures (American Academy of Pediatrics Work Group on Breastfeeding, 1997). Lactational amenorrhea is attributed with decreased blood loss as well as aiding in child spacing (Kennedy, Lobbok, & Van Look, 1996). Statistically significant differences in postpartum weight changes were found between formula feeding and breastfeeding mothers every month postpartum from months 2 to 12. Maternal weight for those who breastfed averaged 2.8 kilograms less at six months and 3.2 kilograms less at 12 months (Dewey, Heining, & Nommsen, 1993). Breastfeeding mothers have also been shown to practice healthier habits such as not using drugs (American Academy of Pediatrics Work Group on Breastfeeding, 1997). In addition to the numerous maternal health benefits, the decision to breastfeed can positively impact the individual and national economy.

Economic benefits. Financial benefits of breastfeeding should also be considered as potential incentives. Low income Latinas are at especially low risk of breastfeeding, making the financial costs of not breastfeeding an aspect of interest to this population. Pugh et al. (2002) concluded that breastfed infants have fewer hospital visits due to decreased illness. Breastfeeding mothers and families have fewer financial expenses including the lack of necessity to purchase infant formula and fewer medical bills (Pugh, Milligan, Frick, Spatz, & Bronner, 2002). Riordan (1997) assessed four medical complications that are more common among formula fed infants. These include diarrheal

diseases, respiratory syncytial virus, otitis media, and insulin dependent diabetes. The total annual medical costs of these diagnoses result in an additional total of \$1 billion nationally for health care. Riordan (1997) also found that infant formula costs twice as much as of the amount food needed to purchase for a lactating mother, meaning two breastfed infants can be fed for each one formula fed infant. These estimates do not take into account indirect financial losses such as work missed to care for the infant or decreased quality of life indicators (Riordan, 1997).

In 2001, Weimer showed that the national health care expenditure attributed to the current low rates of breastfeeding accounted for \$3.6 billion annually (Weimer, 2001). Additional losses include decreased family income for time off work and, at the industrial level, greater expenditure of production energy for infant formula manufacturing (Cohen, Mrtek, & Mrtek, 1995; Jarosz, 1993; Levine & Huffman, 1990).

Breastfeeding results in fewer health complications for baby, mother, and financial savings at the individual and national levels. These infant health, maternal health, and economic benefits support the need to promote breastfeeding and may be particularly beneficial to the low income Latino population.

Population and Disparities

The Latino population has become the largest minority group in the US and is anticipated to continue growing. The 2010 Census found that of the 308 million residents in the US, 50.5 million (16%) were Latino, as seen in Figure 2. Growth in the Latino population from 2000 to 2010 accounted for over half of the total population growth in the US. The Latino population grew 43%; four times the national rate. Some of the largest populations of Latinos reside in California, Texas, and Florida. According to the

2010 US Census, Latinos comprised 28% (14 million) of California’s population, 19% (9.5 million) of Texas’, and 8% (4.2 million) of Florida’s (US Census Bureau, 2011). The recent growth of the Latino population in the US influences national level breastfeeding rates.

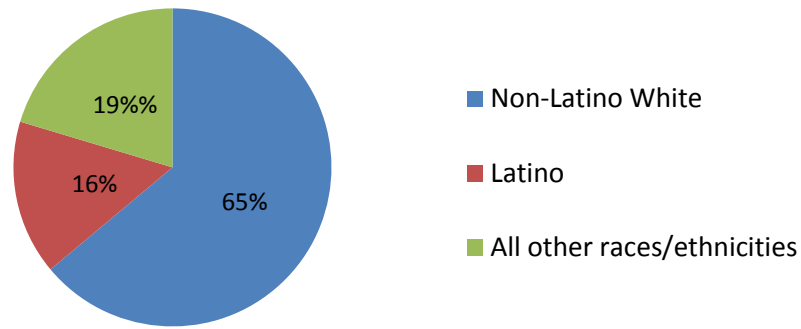


Figure 2. Percent distribution of US population, 2010.

US breastfeeding rates reached lows of 3.2% and 5.4% for exclusive and any breastfeeding at six months, respectively, in 1971. One of the most dramatic declines occurred from 1983 to 1989 when both exclusive breastfeeding and any breastfeeding in hospital dropped nearly 10% reaching 43% and 51%, respectively (Ryan et al., 2002). Today, breastfeeding rates in the US are well below recommendations for all women, but are especially reflected in the Latina population (Holmes, Auinger, & Howard, 2011). In 2007, only 13.4% of Latina mothers breastfeed exclusively at six months (CDC, 2007a) despite the target of 25.5% (USDDHS, 2011). In 2009, 34% of Latinos lived in poverty compared to 13% of Whites (US Census, 2010). In the US, Latinos are the primary minority group and represent the majority of the low income population.

Low income groups have lower rates of breastfeeding incidence, exclusivity, and duration compared to higher income groups. Mothers of low socioeconomic status have even lower initiation and continuation rates at six months (CDC, 2007a; CDC, 2007b).

From 1999 to 2006, the CDC reported that 74% of higher income mothers breastfed compared to 57% of low income mothers (CDC, 2008). In the US, Latinos are less likely to breastfeed, but also comprise the majority of the low income group, which is also less likely to breastfeed. There is an overlapping association between Latinos, minority status, and low income status, all of which are negatively associated with breastfeeding rates.

Influencing Factors

Economic and educational barriers. Despite a woman's knowledge of the benefits of breastfeeding, low income mothers may be compelled not to breastfeed due to barriers related to low socioeconomic status (Zimmerman & Guttman, 2001). Low income mothers have more urgent financial obligations, requiring them to return to work or school sooner. Employment situations of low income mothers are also more likely to be less flexible and limited in terms of privacy, not allowing for breastfeeding at the workplace or time away to breastfeed. Breastfeeding may therefore be associated with financial loss and/or time loss (Raisler, 2000). Existing breastfeeding support groups or educational resources may not be easily accessible for low income mothers due to lack of childcare or transportation (Humphrys, Thompson, & Miner, 1998). Mothers of low socioeconomic status tend to have lower education levels, which is also associated with lower breastfeeding rates. Women with less than a high school education reported "ever breastfeeding" at 9.3% compared to 54.7% among women who had greater than high school education (Zimmerman & Guttman, 2001). Fewer years of formal education also raises the question of the effectiveness of written educational materials. To reach the widest possible audience, it has been recommended that any literature be written at a fourth to sixth grade reading level and include illustrations (Raisler, 2000). Barriers

related to socioeconomic status and education are not the only influencing factors in the decision to breastfeed, and other factors specific to the Latino population should also be considered for the design of effective interventions.

Lifestyle barriers. Other factors identified as barriers to breastfeeding include pain, embarrassment, diet changes, and inconvenience. Bunik et al. (2006) identified pain as the primary reason to not breastfeed whereas another study identified pain for all groups as a barrier to breastfeeding (Bunik et al., 2006; Gill, Reifsnider, Mann, Villarreal, & Tinkle, 2004). However, grandmothers participating did not mention pain as a factor or barrier, which suggests that this issue has emerged over the past few generations (Gill et al., 2004). Embarrassment was identified as another barrier to breastfeeding. Immodest exposure was of great concern for some women and some grandmothers described breastfeeding in public as inappropriate. When men were asked, one study found the men to be greatly concerned for their partner to be exposed in public (Gill et al., 2004), whereas another study found this issue to be of minor concern (Bunik et al., 2006). The two alternative options suggested by mothers and their partners were to either cover the mother with a blanket or to bottle feed. Some mothers identified dietary restrictions as a barrier for breastfeeding. Common beliefs among mothers and family members include the need to restrict or omit beans, spicy foods, soda, caffeine, alcohol, medications, and smoking in addition to supplementation of greater protein and vegetable intake, and an overall “healthier” diet (Bunik et al., 2006, Gill et al., 2004). Inconvenience was another barrier to breastfeeding listed by mothers. The time needed to breastfeed was reported to take time away from the mother, other children, and home responsibilities. Working mothers or mothers attending school also felt that they had no other option due to their

inability to spend the time required to breastfeed and felt they would be confined to the house if they chose to do so (Bunik et al., 2006, Gill et al., 2004).

Acculturation. A key factor that must be considered when evaluating breastfeeding rates among Latina women is acculturation status. Acculturation can be defined as “the extent to which people from one culture adapt or accommodate their behavior and thoughts to their perceptions of the norms of a second culture” (Rassin et al, 1994, p. 740). According to Bunik et al., cultural beliefs affecting Latinas included the belief that the mother does not have milk, failed attempts to breastfeed, desired chubbiness of the baby, and the emotional connection believed to be associated with breastfeeding (Bunik et al., 2006). Using NHANES data, Gibson et al. (2005) found that higher acculturation was associated with a decreased likelihood of breastfeeding even when education, age, and income were taken into account. Women were categorized as being of “high” or “low” acculturation level based on a validated scale of high internal reliability. Questions used to determine the level of acculturation related to the language used in the home, outside of the home, what language one thinks in, generational status in the US, time living in the US, and the degree of perceived similarity to US whites and African Americans. Gibson et al. compared breastfeeding rates of Hispanics with high acculturation levels, Hispanics with low acculturation levels, and Whites. Hispanic women with low acculturation levels initiated breastfeeding at the highest rates of 59.2%, compared to either Hispanics with high acculturation levels or white women who breastfed 33.1% and 45.1%, respectively (Gibson, Diaz, Mainous, & Geesey, 2005). Rassin et al. (1994) also found that in a study of Mexican women 52.9% of the least acculturated initiated breastfeeding while only 36.1% of the most acculturated women

initiated breastfeeding (Rassin et al, 1994). Therefore, acculturation affects the breastfeeding decisions of the Latina population.

A literature review that examined breastfeeding found high acculturated Latinas to have lower breastfeeding initiation rates. Low acculturated Hispanic women were the most likely to initiate breastfeeding in comparison to other ethnic groups (Humphreys et al., 1998) and were 5.8 times more likely to exclusively breastfeed if they were not born in the US (Pachon & Olson, 1999). Mothers born in Mexico were more likely to have the intent to breastfeed (Romero-Gwynn & Carias, 1989). Less acculturated mothers were two times more likely to breastfeed than those that were highly acculturated (John & Martorell, 1989; Rassin et al., 1994). Acculturation may be related to the differences of breastfeeding prevalence since disparities exist between Latinas who are highly acculturated and less acculturated.

Some of the key aspects of acculturation include number of years of residency in the US and the amount of English used. An increase in years of US residency and increase of the usage of English have been found to negatively correlate with the likelihood for breastfeeding (Gibson-Davis & Brookes-Gunn, 2006); Rassin et al., 1994). Being born outside of the US is a stronger determinant for breastfeeding than either race or ethnicity (Gibson-Davis & Brookes-Gunn, 2006). Mothers born outside the US have significantly higher breastfeeding rates than those born inside the country. Use of English inside the home has also been found to be inversely associated with breastfeeding.

Influence of others. The opinion and support of other individuals is influential to the mother's decision whether or not to breastfeed. The input of a health care professional is a primary source of encouragement for breastfeeding when considering Mexican-

Americans, Caucasians, and African-Americans. Mexican-Americans however, rely on the encouragement of friends, partners, and mothers more than both African Americans and Caucasians. Consideration of a partner's input about breastfeeding accounted for over 45% of the infant feeding decision for Mexican-Americans compared to about 30% and 15% for Caucasians and African-Americans, respectively. Aside from health care providers, partners were the next most influential source recorded in the decision to feeding for Mexican-Americans. Of those that chose to breastfeed, 67% received encouragement from their partner while 21% of those who chose not to breastfeed received encouragement to breastfeed from their partner. Of those who breastfeed, about 40% of Mexican-Americans received encouragement from their mother, compared to about 15% and about 25% for African-Americans and Caucasians, respectively. Friends were another source of encouragement for all three groups and accounted for about 20%, 5%, and 10% for Mexican-Americans, African-Americans, and Caucasians, respectively. (Wiemann, 1998). Therefore, peer intervention groups may be an effective method to address factors affecting breastfeeding decisions and promote breastfeeding among the growing low income Latina population.

Methods

A literature review search was conducted by searching PubMed and Google Scholar to find peer based breastfeeding promotion studies among low income Latina women. The search included the following key words and combinations: Latino(s), Hispanic(s), low income, peer(s), counselor(s), educator(s), breastfeeding, peer education, intervention, promotion, United States. Breastfeeding promotion studies were included if they were conducted in the United States, included only or predominantly

Latino populations (>60%), and the population was defined as low income. The term “Hispanic” was also accepted. No timeframe restriction was used for years searched. Of the 14 articles initially retrieved for review, nine were excluded for not meeting the above criteria. A total of five articles were used in this literature review (Table 1).

Peer Interventions

In a prospective randomized controlled trial, Chapman et al. (2004a) assessed the effectiveness of an existing peer counseling intervention in a Hartford, Connecticut Baby-Friendly Hospital. The “Breastfeeding: Heritage and Pride” peer counseling model was used for any hospital patients who planned to breastfeed. This model was designed to target the Latina population and the intervention group services were based on this model. The sample recruited was 219 low income, pregnant, predominantly Latina women and the staff was comprised of eight peer members.

Information was gathered at 0, 1, 3, and 6 months to compare breastfeeding rates between the control group and the peer counseled group. The control group received routine hospital breastfeeding education provided by the Baby-Friendly Hospital. This included written materials, hands-on breastfeeding education, and access to the “warm-line” 24-hour telephone service for postpartum for questions. The intervention group received the same services as the control group as well as one prenatal home visit, daily perinatal visits, and three postnatal visits This included written materials, discussions, and breast screenings. Participants were followed up via telephone for up to six months or until breastfeeding cessation. The peer counseling positively affected breastfeeding initiation and breastfeeding duration, but not exclusive breastfeeding rates. The rates of not initiating breastfeeding were 8.9% for peer counseling group and 22.7% for the

Table 1. Studies included in literature review

Reference	Sample	Design/Measures	Intervention	Results
Chapman et al. (2004a)	165 predominantly Latina, low-income women recruited from Hartford, Connecticut	- Bilingual peer counselors - Baby Friendly Hospital - Breastfeeding initiation & duration	- Evaluation of existing program - At least one prenatal home visit - Phone calls as needed	- Breastfeeding initiation: 90% intervention group vs. 77% control group - Breastfeeding at 1 month: 64% intervention group vs. 50% control group - Breastfeeding at 3 months: 44% intervention group vs. 29% control group
Chapman et al. (2004b)	Same as Chapman et al. (2004a)	- Identify most responsive peer counseled mothers from Chapman et al 2004a	- Four series multivariate logistic regression models	Breastfeeding initiation: 90.4% intervention group vs. 67.4% control group (Multiparae), 78.6% intervention group vs. 33.3% control group (uncertain mothers)
Anderson et al. (2005)	135 predominantly Latina, low-income women recruited from Hartford, Connecticut	- Bilingual peer educators - Baby Friendly Hospital - Exclusive breastfeeding	- Response to Chapman et al. - 3 prenatal home visits, daily perinatal visits, 9 postpartum home visits, phone contact as needed	- Exclusive breastfeeding: 27% peer counseled group vs. 2.7% control group
Gill et al. (2007)	200 Mexican-American women recruited prenatally in southwest US	Breastfeeding initiation & duration	- Prenatal education - Minimum of 1 home visit postpartum - 5 phone calls (first 6 weeks postpartum) & monthly calls (3-6 months postpartum)	- Breastfeeding initiation: 82.3% intervention group vs. 67.1% control group - Breastfeeding at 6 months: 43% intervention group vs. 21% control group
Sandy et al. (2009)	238 low-income, Latina immigrants recruited from New York	Healthy Families America (HFA) Model - Any & exclusive breastfeeding	- Weekly prenatal home visit/education, perinatal visits, weekly postpartum home visits	- Exclusive breastfeeding (at one week postpartum): 32% intervention group vs. 20% control group - Acculturation & no household income significantly decreased likelihood to breastfeed

control group (RR, 0.39; 95% CI, 0.18-0.86). “Any breastfeeding” at one and three months were marginally significant, with the intervention group still at lower relative risk for not breastfeeding. Results at one month were 35.7% and 49.3% (RR, 0.72; 95% CI, 0.50-1.05), respectively, for intervention and control groups, and at month three rates were 55.6% and 70.8% (RR, 0.78; 95% CI, 0.61-1.00), respectively.

Rates of not breastfeeding were negatively associated with the peer counseling group compared to the control group. Rates at one month postpartum were 35.7% and 49.3%, respectively, and at three months 55.6% and 70.8%, respectively (Chapman, Damio, Young, & Pérez-Escamilla, 2004a).

Authors concluded that peer counselors could positively affect breastfeeding rates among low income Latinas in the US. Although most other studies focused on exclusive breastfeeding rates, similar results were reflected in that peer counseling interventions positively affected breastfeeding rates (Chapman et al., 2004a; Dennis et al., 2002; Morrow et al., 1999). Discrepancies exist between results found in articles such as Anderson et al. (2005) and Sandy et al. (2009) which found that peer counselors positively affect exclusive breastfeeding over any breastfeeding (Anderson et al., 2005; Sandy et al., 2009). This was not observed by Chapman et al. (2004a), perhaps attributable to the fact that the intervention did not specifically focus on exclusive breastfeeding. Results may have been affected by the Baby-Friendly Hospital environment and that participating women were eligible for WIC programs, which meant that they had access to free infant formula.

Chapman et al. (2004b) used the data from the previously described randomized controlled trial (Chapman et al., 2004a); logistic regression models were used to identify

subgroups most responsive to the peer counseling through initiation or extended duration of breastfeeding rates. Subjects received monthly follow-up telephone calls for six months postpartum to gather demographic information and infant feeding data.

Subgroups with higher initiation rates or greater likelihood to breastfeed at 0, 1, 3, and 6 months postpartum in peer counseling groups were considered “responders”. These responders were identified using four series of multivariate logistic regression models.

Two subgroups identified as responsive to the peer counseling were multiparae mothers and mothers who reported “unsure” about their decision to breastfeed. Multiparae mothers of the peer counseling group were six (OR= 6.4; 95% CI, 1.9-20.8) times more likely to initiate breastfeeding than their control group counterparts, reflected by rates of 90.4% and 67.4%, respectively. Peer counseled mothers who were unsure of their breastfeeding decision were 7 (OR= 11.9; 95% CI, 1.2-111.1) times more likely to initiate breastfeeding than the control group. Peer counseling unsure mothers initiated breastfeeding at 78.6% compared to 33.3% of the control group.

Results demonstrated that peer counselors effectively improved breastfeeding initiation but not duration. No significant differences existed between intervention and control groups at the six month follow-up period. Peer counselors significantly affected breastfeeding initiation rates of women who were unsure of their decision to breastfeed and multiparae mothers of a low income, predominantly Latina population (Chapman, Damio, Young, & Pérez-Escamilla, 2004b). Although other studies did not focus on these particular subgroups, Gill et al. (2007) also found peer counseling to positively affect breastfeeding initiation rates (Gill, Reifsnider, & Lucke, 2007). The Baby-Friendly

environment of the hospital may have influenced breastfeeding rates that may not have been reflective of a hospital that was not “Baby-Friendly”.

Following the Hartford studies by Chapman et al., Anderson et al. (2005) evaluated the efficacy of a peer counseling intervention for the promotion of exclusive breastfeeding among predominantly Latina women in Hartford, Connecticut. This randomized control trial assigned 162 low income women to either the control group or the peer counseling intervention group. Recruitment of women less than 32 weeks of gestation who were considering breastfeeding took place from January 2003 to July 2004 in three waiting areas of clinics in Hartford’s Hospital, a Baby Friendly hospital. A three stage inclusion of mother and infant determined eligibility of the dyad. Medical records were reviewed, six inclusion criteria were to be met, and postpartum screenings ensured mother and infant were still eligible.

The control group received the normal education and support any patient would in the Baby-Friendly hospital, which included hospital staff trained in lactation education and support as well as a 24 hour open call line for support and counseling from a nurse or lactation consultant after discharge. In addition, the peer counseling group received three prenatal home visits, daily perinatal visits, and nine postpartum home visits.

The results of this study showed that the peer counseling group was more likely to initiate breastfeeding and exclusively breastfeed throughout the study. Breastfeeding initiation rates were 76% for control group and 91% for the peer counseling group (RR= 1.35; 95%CI, 0.94-1.93). Exclusive breastfeeding rates were also higher for the peer counseling group than the control group at 59% and 44%, respectively. The peer counseling group was 15 times more likely to exclusively breastfeed throughout the study

compared to the control group. Exclusive breastfeeding was significantly higher in the peer counseling group than the control group at months one, two, and three postpartum. At three months postpartum, 1.4% of the control group mothers were exclusively breastfeeding compared to 20.6% of the peer group (RR= 1.24; 95% CI, 1.09-1.41). During the study, control group infants were also at higher risk of experiencing one or more diarrheal episode.

The authors concluded that trained peer-counselors can effectively promote exclusive breastfeeding in a Baby-Friendly Hospital in the US (Anderson et al., 2005). Results of similarly designed randomized controlled trials in other countries had similar outcomes (Dennis et al., 2002; Morrow et al., 1999). The intervention was intentionally very similar to that of Chapman et al. (2004a) but targeted exclusive breastfeeding, whereas Chapman et al. targeted “any breastfeeding rates” and the intervention did not affect exclusive breastfeeding rates. Anderson et al. used a similar design to allow comparison between similar trials with different specific goals. This demonstrates the effectiveness of designing an intervention specific to “exclusive” versus “any” breastfeeding (Chapman et al., 2004a; Anderson, Damio, Young, Chapman, & Pérez-Escamilla, 2005). The study was single-blinded, an important limitation of the study because the interviewers were aware of the study hypotheses. The requirement that mothers must already be considering breastfeeding created selection bias. Authors indicated that these results were important because breastfeeding initiation rates were low among the studied population and early weaning was typical for those who choose to initiate breastfeeding (Anderson et al., 2005).

Gill et al. (2007) designed a breastfeeding intervention based on findings from a previous study in Texas that used focus group sessions to discuss barriers to breastfeeding with low income Mexican-American WIC clients (Gill et al., 2004; Gill et al., 2007). Women were recruited during their second trimester of pregnancy from a public health department maternity clinic and a WIC clinic in the southwestern United States. The goal of study was to observe if differences existed between the intervention group and the control group in the rates of breastfeeding initiation and six month duration.

Women were previously assigned to two groups from a previous study so assignments to the intervention and control groups were not random. Intervention group staff consisted of bilingual International Board Certified Lactation Consultants (IBCLC) and certified lactation educators. At the beginning of the study and again after 36 weeks gestation, the intervention group met individually with an IBCLC at the clinic where questions could be asked and educational information was provided. At four days, and two, three, four, and six weeks postpartum and monthly from months three to six, follow-up phone calls were made to mothers. Home visits were made if requested by the participant or deemed necessary by the consultant and each were followed-up via phone calls. Each intervention group participant received a minimum of one home visit and was provided with supplies such as bra pads and nipple creams. Interventions provided were specific to the problems, issues, or concerns of each participant. The control group received the standard breastfeeding education provided by the clinic and were offered WIC clinic breastfeeding classes if desired. The control group received weekly phone

calls until the last day the infant was put to the breast to measure duration of breastfeeding.

Participants of the intervention group initiated breastfeeding at 82.3% versus the control group at 67.1% (OR= 2.31; 95%CI, 1.10-4.96). Duration at six months was also positively affected by the intervention in comparison to the control group as seen by the rates of 43% and 21%, respectively (Gill et al., 2007). For both the intervention and control groups, the tendency to immediately quit breastfeeding fell during the first two weeks and then remained relatively stable. Quit rates in both groups were higher around days 15, 30, and 45 but continually remained lower in the intervention group. The intervention group had half the tendency to quit breastfeeding at any point throughout the study. The peer intervention group had increased rates of breastfeeding initiation, duration through six months, and decreased tendency to quit breastfeeding compared to the control group.

The authors concluded that implementation of a peer counseling based intervention is an effective way to promote breastfeeding initiation, exclusive breastfeeding, and lower quit rates among Mexican-Americans in the US (Gill et al., 2007). These results were in line with those of Anderson et al. and Sandy et al. who demonstrated that peer intervention groups had higher exclusive breastfeeding rates than control groups in a low income Latina population (Anderson et al., 2005; Sandy et al., 2009). Breastfeeding initiation and duration rates in the study by Chapman et al. were also higher among low income Latinas who participated in the peer intervention group than the control group (Chapman et al., 2004a). Potential bias existed in this study because participants were not randomly assigned. The bilingual staff and culture

contributed to the culturally specific design of this study. The individualized interventions specific to the concerns and needs of each participant added to the success of the study (Gill et al., 2007).

Sandy et al. (2009) performed a randomized controlled trial to compare the rates of “any breastfeeding” and “exclusive breastfeeding” among women in New York City. Participants were selected from a large community based organization that was part of an initiative called Healthy Families America. The 238 low income, predominantly immigrant (88%) pregnant women who met the criteria were either exposed to a prenatal intervention group or assigned to the control group. Less than 0.5% (one mother) of the sample identified as African-American, 87% identified as being of Dominican ethnicity, and the remainder of the sample identified other Latin American countries of origin. The control group received one or two prenatal home visits where basic breastfeeding information was given, primarily through pamphlets, and references for further information were provided. This group was not followed up and did not participate in discussions regarding the information provided. Weekly prenatal visits by trained Family Assessment Workers (FAW's) were provided for the intervention group. Materials were available in English and Spanish and presentation was based on the Healthy Families America model. Information presented was similar to that of the control group, however the intervention group additionally received time for discussions and were then followed up in the hospital.

A significant difference was found between the intervention and control groups such that “exclusive breastfeeding” rates were 32% and 20%, respectively (OR 1.92; 95% CI 1.05-3.52). Rates of “any breastfeeding” were not different between the two groups.

A significant decrease in “any breastfeeding” was associated with acculturation and lack of household income. A decrease in “exclusive breastfeeding” rates was also significantly associated lack of household income. When predictor variables were assessed in a stepwise fashion, lack of household income and exposure to the intervention accounted for 3.3% and 2.1% of the variance, respectively.

These results demonstrate the effectiveness of a Healthy Families America model prenatal intervention for increasing exclusive breastfeeding following the first week postpartum among a predominantly immigrant, urban, Latina population (Sandy, Anisfeld, & Ramirez, 2009). Increased exclusive breastfeeding was consistent with the results of Anderson et al. (2005) who targeted a low income Latina community. Findings were also consistent with other studies reporting that household income is positively associated with exclusive and any breastfeeding while maternal acculturation is significantly negatively associated with any breastfeeding.

Conclusions

The literature reviewed in this study suggests that peer interventions positively impact breastfeeding rates among low income Latinas in the US. Utilizing a combination of home visits, hospital visits, and phone calls, peer-based interventions significantly and consistently improved breastfeeding outcomes of initiation, duration, and/or exclusivity. Control groups typically only received written educational materials with no opportunities for discussions or home visits. A combination of prenatal, perinatal, and postpartum sessions were included in each study. Peer counseled groups from two studies had 12 to 24.3 percentage points higher exclusive breastfeeding rates (Anderson et al., 2005; Sandy et al., 2009) and three study intervention groups had higher breastfeeding

initiation and duration outcomes (Chapman et al., 2004a; Chapman et al., 2004b; Gill et al., 2007). The Chapman et al. (2004a) study positively affected initiation and duration of any breastfeeding rates through the use of home visits, 24 hour phone lines, and written education materials. Anderson et al. (2005) designed an intervention that positively affected the rates of initiating and exclusively breastfeeding among the intervention group. Sandy et al. (2009) positively affected exclusive breastfeeding rates and not any breastfeeding rates through use of discussions and follow-up hospital and home visits. Breastfeeding initiation and duration rates were higher in the Gill et al. (2007) intervention group which received a prenatal education and a combination of home visits and phone calls postpartum. These various outcomes may be attributable to the different designs of each study.

The different emphases in the design of the study were directly reflective of their breastfeeding outcomes. Studies that focused primarily on exclusive breastfeeding at the start of the study resulted in higher rates of exclusive breastfeeding, whereas studies focusing on breastfeeding initiation and duration at the start of the study resulted in higher rates of initiation and duration. This demonstrates the importance of the desired breastfeeding outcome to be incorporated into the design of the study.

Routine breastfeeding education received by control groups consisted primarily of written educational materials about breastfeeding. Control groups of the Baby Friendly Hospitals in three studies had access to hospital staff that was trained specifically for the promotion and assistance of breastfeeding compared to a non-Baby-Friendly Hospital (Chapman et al., 2004a; Chapman et al., 2004b; Anderson et al., 2005). This demonstrates the positive breastfeeding outcomes of intensive interventions which

consist of more than educational materials similar to those received in the control groups of these studies. This would include home visits and contact with the mother postpartum to offer support through home visits and/or phone calls. Results suggest breastfeeding education alone is not sufficient due to the range of other factors involved. Success of the postpartum support strategies reflect the need for mothers to feel encouraged of their decision to breastfeed and to be aided in overcoming barriers to breastfeeding.

Studies also assessed the impact of other factors such as income, acculturation, and decision of mother to breastfeed, all of which showed significant and independent effects on breastfeeding outcomes. This indicates a need for research and intervention programs to consider the multi-faceted aspects of breastfeeding, including social, economic, and cultural contexts.

The limited number of studies focusing on this specific topic leaves more room for research. For example, three of the reviewed studies used communities served by the Hartford Baby Friendly hospitals, which may have resulted in low external validity. Different outcomes may have been expected if a similar approach were used in different communities. A mode of implementing peer educators as an accessible and affordable way to support breastfeeding at the community level has not yet been addressed.

Importantly, resources required to train and maintain peer educators should be a focus of future research, as few studies have conducted economic analyses on the cost-effectiveness of such interventions. Methods to implement peer counselors in a public health setting available to low income Latina mothers have also not been established. Indeed, analyses examining the potential range of benefits associated with peer interventions for breastfeeding in relation to the costs associated with training and

implementing such programs have not been conducted. Future research utilizing a range of study designs in diverse communities is still needed. Moreover, quantitative analyses are needed to establish the strength of association between peer counselor programs and breastfeeding outcomes among low income Latina mothers.

The many benefits associated with breastfeeding demonstrate the importance for interventions designed to improve initiation, exclusivity, and duration rates. Peer interventions are a culturally sensitive, affordable, and highly effective method to promote breastfeeding among low income Latinas. Peer intervention programs should be considered by public health programs and supported by relevant policies as a means to improve breastfeeding rates among an at-risk group.

References

- American Academy of Pediatrics Work Group on Breastfeeding. (1997). Breastfeeding and the use of human milk. *Pediatrics* 100, 1035–1039.
- Anderson, A., Damio, G., Young, S., Chapman, D. J., & Pérez-Escamilla, R. (2005). A randomized trial assessing the efficacy of peer counseling on exclusive breastfeeding in a predominantly Latina low income community. *Archives of Pediatrics & Adolescent Medicine*, 159 (9), 836-841.
- Apple, D. (1980). To be used only under the direction of a physician: commercial infant feeding and medical practice, 1870-1940. *Bulletin of the History of Medicine*, 54(3), 502-417.
- Bunik, M., Clark, L., Zimmer, L. M., Jimenez, L. M., O'Connor, M. E., Crane, A. L., et al. (2006). Early infant feeding decisions in low income Latinas. *Breastfeeding Medicine* 1(4), 225-235.
- Chapman, D., Damio, G., Young, S., & Pérez-Escamilla, R. (2004a). Effectiveness of breastfeeding peer counseling in a low income, predominantly Latina population. *Archives of Pediatrics & Adolescent Medicine*, 158, 897-902.
- Chapman, D., Damio, G., Young, S., & Pérez-Escamilla, R. (2004b). Differential response to breastfeeding peer counseling within a low income, predominantly Latina population. *Journal of Human Lactation* 20(4), 389-396.
- Center for Disease Control and Prevention (2007a). *Provisional exclusive breastfeeding rates by socio-demographic factors, among children born in 2007*, available at: http://www.cdc.gov/breastfeeding/data/NIS_data/2007/socio-demographic.htm (retrieved on 10 October 2011).

- Center for Disease Control and Prevention (2007b). *Provisional Formula Supplementation of Breast Milk Rates by Socio-demographic Factors, Among Children Born in 2007*, available at: http://www.cdc.gov/breastfeeding/data/NIS_data/2007/socio-demographic_formula.htm (retrieved 27 October 2011).
- Center for Disease Control and Prevention. (2008). *Breastfeeding in the United States: Findings from the National Health and Nutrition Examination Survey, 1999-2006*, available at: http://www.cdc.gov/nchs/data/databriefs/db05.htm#More_Likely (retrieved on 5 October 2011).
- Center for Disease Control and Prevention. (2010). *Breastfeeding report card- United States, 2010*. Atlanta, GA: Author.
- Cohen, R., Mrtek, M. B., & Mrtek, R. G. (1995). Comparison of maternal absenteeism and infant illness rates among breast-feeding and formula-feeding women in two corporations. *American Journal of Health Promotion, 10*, 148–153.
- Dennis, C., Hodnett, E., Gallop, R., & Chalmers, B. (2002). The effect of peer support on breast-feeding duration among primiparous women: a randomized controlled trial. *Canadian Medical Association Journal, 166*(1), 21-8.
- Dewey, K., Heinig, M., & Nommsen, L. (1993). Maternal weight loss patterns during prolonged lactation. *American Journal of Clinical Nutrition. 58*(2), 162-6.
- Gibson, M. V., Diaz, V. A., Mainous, III, A. G., & Geesey, M. E. (2005). Prevalence of breastfeeding and acculturation in Hispanics: Results from NHANES 1999-2000 study. *Birth, 32*(2), 93-98.
- Gibson-Davis, C. M. & Brookes-Gunn, J. (2006). Couples' immigration status and

- ethnicity as determinants of breastfeeding. *American Journal of Public Health*, 96(4), 641-646.
- Gill, S. L., Reifsnider, E., Mann, A. R., Villarreal, P., & Tinkle, M. B. (2004). Assessing infant breastfeeding beliefs among low income Mexican Americans. *The Journal of Perinatal Education*, 13(3), 39-50.
- Gill, S. L., Reifsnider, E., & Lucke, J. F. (2007). Effects of support on the initiation and duration of breastfeeding. *Western Journal of Nursing Research*, 29(6), 708-723.
- Hanson, L. A., Jahil, F., Ashraf, R., Bernini, S., Carlsson, B., Cruz, J.R., et al. (1991). Characteristics of human milk antibodies and their effect in relation to the epidemiology of breastfeeding and infections in a developing country. *Advances in Experimental Medicine and Biology*, 310, 1-15.
- Ho, M., Glass, R., Pinsky, P., Young-Okoh, N., Sappenfield, W., Buehler, J., et al. (1988). Diarrheal deaths in American children. Are they preventable? *Journal of the American Medical Association*. 260 (22), 3281-3285.
- Holmes, A. V., Auinger, P., & Howard, C. R. (2011). Combination Feeding of Breast Milk and Formula: Evidence for Shorter Breast-Feeding Duration from the National Health and Nutrition Examination Survey. *The Journal of Pediatrics* 159(2), 186-191.
- Horta, B. L., Bahl, R., Martines, J. C., & Victoria, C. G. (2007). *Evidence on the long-term effects of breastfeeding: systematic reviews and meta-analyses*. Geneva, Switzerland: World Health Organization.
- Humphreys, A. S., Thompson, N., & Miner, K. (1998). Intention to breastfeed in low-

- income pregnant women: The role of social support and previous experience. *Birth* 25(3), 169-174.
- Jarosz, L. A. (1993). Breast-feeding versus formula: cost comparison. *Hawaii Medical Journal*, 52(1), 14–18.
- John, A., & Martorell, R. (1989). Incidence and duration of breast-feeding in Mexican-American infants, 1 970-1982. *American Journal of Clinical Nutrition*, 50, 868-874.
- Kennedy, K.I., Labbok, M.H., & Van Look, P.F. (1996). Lactational amenorrhea method for family planning. *International Journal Gynecology & Obstetrics*, 54, 55–57.
- Kramer, M.S., & Kakuma, R. (2004). The optimal duration of exclusive breastfeeding: a systematic review. *Advances in Experimental Medicine and Biology*, 554, 63-77.
- Levine, R. E., & Huffman, S. L. (1990). *The Economic Value of Breastfeeding, the National, Public Sector, Hospital and Household Levels: A Review of the Literature*. Washington D.C., NUTURE. Center to Prevent Childhood Malnutrition.
- Morrow, A., Guerrero, M., Shults, J., Calva, J., Lutter, C., Bravo, J, et al. (1999). Efficacy of home-based peer counseling to promote exclusive breastfeeding: A randomized controlled trial. *Lancet*, 353(9160), 1226-1231.
- Morrow-Tlucak, M., Haude, R., & Ernhart, C. (1988). Breastfeeding and cognitive development in the first 2 years of life. *Social Science & Medicine*, 26(6), 635-639.
- Mortensen, E., Michaelsen, K., Sanders, S., & Reinisch, J. (2002). The association between duration of breastfeeding and adult intelligence. *Journal of the American*

- Medical Association*, 287 (18) 2365-2371.
- Pachon, H. & Olson, C. (1999). Retrospective analysis of exclusive breastfeeding practices among four Hispanic subgroups in New York's EFNEP. *Journal of Nutrition Education*, 21, 113-118.
- Pugh, L., Milligan, R., Frick, K., Spatz, D., & Bronner, Y. (2002). Breastfeeding duration, costs, and benefits of a support program for low income breastfeeding women. *Birth* 29, 2.
- Raisler, J. (2000). Against the odds: Breastfeeding experiences of low income mothers. *Journal of Midwifery & Women's Health*, 45(3), 253-263.
- Rassin, D., Markides, K., Baranowski, T., Richardson, C., Mikrut, W., & Bee, D. (1994). Acculturation and the initiation of breastfeeding. *Journal of Clinical Epidemiology*, 47(7), 739-746.
- Riordan, J. M. (1997). The cost of not breastfeeding: a commentary. *Journal of Human Lactation*, 13(2), 93-97.
- Romero-Gwynn, E. & Carias, L. (1989). Breast-feeding intentions and practice among Hispanic mothers in Southern California. *Pediatrics*, 84, 626-632.
- Ryan, A.S., Wenjun, Z., & Acosta, A. (2002). Breastfeeding continues to increase into the new millennium. *Pediatrics*, 110(6), 1103-9.
- Sandy, J., Anisfeld, E., & Ramirez, E. (2009). Effects of a prenatal intervention on breastfeeding initiation rates in a Latina immigrant sample. *Journal of Human Lactation*, 25(4), 404-411.
- US Census Bureau. (2010). *Annual Social and Economic (ASEC) Supplement*,

- available at <http://www.census.gov/hhes/www/cpstables/032010/pov/toc.htm>
(retrieved on 29 November 2011).
- US Census Bureau. (2011). *The Hispanic Population: 2010 Census Briefs*, available at <http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf> (retrieved on 5 October 2011).
- U.S. Department of Health Human Services [USDHHS]. (2006a). *Breastfeeding exclusively through 6 months*, available at: http://www.healthindicators.gov/Indicators/Breastfeeding-exclusivelythrough6months_1151/Profile/Data (retrieved on 15 October 2011).
- U.S. Department of Health Human Services [USDHHS]. (2006b). *Breastfeeding at 6 months*, available at: http://www.healthindicators.gov/Indicators/Breastfeeding-at6months_1148/Profile/Data (retrieved 15 October 2011).
- U.S. Department of Health Human Services [USDHHS]. (2011). *Healthy People 2020 National Objectives*, available at <http://healthypeople.gov/2020/topicsobjectives/2020/objectiveslist.aspx?topicId=26> (retrieved on 8 October, 2010).
- Weimer, J. (2001). *The Economic Benefits of Breastfeeding: A Review and Analysis*. Food and Rural Economics Division, Economic Research Service, U.S. Department of Agriculture. Food Assistance and Nutrition Research Report No. 13.
- Wiemann, C., DuBois, J., & Berenson, A. (1998). Racial/Ethnic differences in the decision to breastfeed among adolescent mothers. *Pediatrics*, 101(6), 1-8.
- World Health Organization. (2002). *Infant and young child nutrition: Global strategy on infant and young child feeding*. Geneva, World Health Organization.

World Health Organization and UNICEF. (1989). *Protecting, promoting, and supporting breastfeeding: The special role of maternity services*. Geneva, World Health Organization.

World Health Organization Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality. (2000). Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. *Lancet*, 355(9202), 451 – 455.

Zimmerman, D. R., & Guttman, N. (2001). "Breast is best": Knowledge among low-income mothers is not enough. *Journal of Human Lactation*, 17(1), 14-19.