Pragmatic Effectiveness of the *Loving Support Peer Counseling* Program to Increase Breastfeeding Duration Among Nevada WIC Participants

Share this:

Helen See, MPH^a

Julie Smith-Gagen, MPH, PhD^b

Robin Hollen, MEd, BSN, RN, IBCLC, FILCA^c

Larissa L. White, MPH^d

Elizabeth J. Christiansen, PhD^e

Peer counseling programs are increasingly popular, and intervention trials have established efficacy. However, pragmatic, real-world effectiveness of peer counseling programs are limited, but necessary, to justify funding. This study examined the effectiveness of the Loving Support Peer Counseling (LSPC) program to increase breastfeeding duration and reasons for cessation among Women, Infants, and Children (WIC) participants. In a sample of 178 WIC participants, new mothers who received LSPC breastfed for an average of 8.6 weeks longer relative to mothers who did not receive LSPC ($p < .001$). Although all mothers cited concerns about infants' nutritional uptake, WIC mothers who did not receive LSPC reported frustration as the reason for breastfeeding cessation. This study supports the pragmatic, real-world effectiveness of LSPC among WIC mothers.

Keywords: breastfeeding; program effectiveness; Women, Infants, and Children Program (WIC); peer support; pragmatic

Breastfeeding is recognized as a learned skill which requires knowledge, resources, strategies, and support to overcome barriers (Bortree, Decher, & Flynn, 2013). Many state-specific laws, policies, and community programs aim to increase breastfeeding initiation and duration. The *Loving Support Peer Counseling* (LSPC) program was launched in 2004 by the United States Department of Agriculture (USDA) to help women enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) initiate and continue breastfeeding (Yun et al., 2010). WIC covers one-half of all infants in the United States (Oliveira, Racine, Olmsted, & Ghelfi, 2015). Various WIC agencies around the nation have implemented the LSPC program at the cost of \$60 million despite a lack of research exploring LSPC's real-world effectiveness (Anderson, Damio, Young, Chapman, & Pérez-Escamilla, 2005; Chapman, Damio, & Pérez-Escamilla, 2004; United States Department of Agriculture, 2015; Yun et al., 2010).

Tightly controlled intervention trials in specific and limited populations, involving highly trained peer counselors and staff, have established the efficacy of LSPC among low-income mothers. Although trials are internally

valid, they lack generalizability and outcomes relevant to stakeholders. They lack identification of ways to enhance patient engagement, identification of unintended consequences and resources, and context that create actionable goals (Glasgow, 2013).

Compared to other Western states, Nevada has lower breastfeeding duration rates at 6 months (45% vs. 49%), but comparable initiation rates (81% vs. 80%; National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 2014; Office of Disease Prevention and Health Promotion [ODPHP], 2016). Since Nevada's initiation rates are "average" relative to other states, it allows us to isolate the effects of duration without having to worry that extreme initiation rates are biasing our results. The *Healthy People 2020* goal is 60% of all babies breastfeeding at 6 months of age (ODPHP, 2016). In 2009, Nevada adopted the LSPC program in 5 of 17 WIC offices. The purpose of this research was to pragmatically determine the effectiveness of the LSPC program delivered by WIC staff to WIC participants with the aim to increase breastfeeding duration, as well as compare the reasons why mothers stopped breastfeeding.

Methods

The researchers randomly chose two of the five Nevada WIC sites offering the LSPC program and two other Nevada WIC sites. Only 5 of the 17 WIC offices in Nevada

a. helen.see@nevada.unr.edu

b. jsmithgagen@unr.edu

c. robinhollen@gmail.com

d. lleewhite@nevada.unr.edu

e. elizabethc@unr.edu

offered the LSPC program due to limited resources (L. Dermid-Grey, Nevada WIC Statewide Breastfeeding Coordinator, personal communication, March 5, 2017). The study examined existing data and surveys collected by WIC staff. The study consisted of 24 mothers in two WIC locations offering LSPC, and 154 mothers from two other (control/comparison) WIC locations. The comparison group sample size was much larger than the LSPC group due to the large population at one of the randomly selected non-LSPC sites. We used data from the prenatal or first postnatal WIC visit, whichever was first, and data from the 6-month WIC visit in this analysis. WIC staff collected information in English or Spanish, and women were asked to report demographic information, number of weeks spent breastfeeding, and reasons why they stopped breastfeeding.

In locations where WIC offered LSPC, WIC invited all mothers to pair with *Loving Support* peer counselors. Counselors contacted mothers on a standard schedule. These counselors are WIC staff who have the following qualifications: experience as a WIC client, personal experience breastfeeding a baby, and LSPC training. The counselor's training consists of a 16-hour competency-based course and quarterly continuing education training (United States Department of Agriculture, 2017). Counselors provide basic breastfeeding education, encouragement, referrals to lactation consultants, community resources, and phone and text messages.

We compared demographic differences between mothers in the LSPC program to the comparison mothers using χ^2 tests at the 95% significance level. Confounding variables are variables known, have an impact on breastfeeding duration, such as the level of education, and, if not addressed in the analysis, could bias our results. To address confounding variables, we statistically adjusted for these variables to reduce bias. Specifically, we used a generalized linear model with an inverse propensity of treatment weighting (IPTW) estimator to control for potential confounding variables (Austin & Stuart, 2015; Cole & Hernán, 2008; Glynn, Schneeweiss, & Stürmer, 2006).

IPTW is a single score representing all the potential confounding variables. To construct an IPTW score, we first conducted logistic regression with the outcome of receipt of LSPC counseling. Predictor variables included in this logistic regression model were potential confounders and included age, race, marital status, education, employment, income, type of delivery, and close relative or friend who breastfed (Brookhart et al., 2006). From the logistic regression, we obtain the probability (propensity score) of receiving LSPC conditional on the confounders

included for each participant. Second, we weighted our final linear regression model (the outcome of duration of breastfeeding and main predictor of receipt of LSPC) by the inverse propensity score calculated in the first logistic regression model.

IPTW was used instead of adding individual confounders to the model for a couple of reasons. First, it allows for fewer degrees of freedom, resulting in greater power to detect differences in our small study population. Second, it can address confounding by indication (Austin & Stuart, 2015; Westreich, Cole, Funk, Brookhart, & Stürmer, 2011). Confounding by indication is any variable that would make women more (or less) likely to participate in peer counseling: for example, the desire to breastfeed, previous experience with breastfeeding, or failure to breastfeed. The effectiveness of the IPTW to control for confounding by indication is addressed by comparing the overlap of the inverse propensity score weights in the treatment (LSPC) and nontreatment (non-LSPC) groups, which were nearly identical in this dataset and suggests adequate adjustment for confounding by indication (data not shown).

We conducted all analyses in SAS version 9.4 (SAS Institute Inc., Cary, NC). Our University's Research Integrity Office determined the study to be exempt from Institutional Review Board review.

Results

Although some differences in the crude (unadjusted for confounders) comparison between LSPC and non-LSPC participants were not statistically different, probably due to small sample sizes, proportions were different with respect to race, age, income, employment status, marital status, and type of delivery (see Table 1). A higher proportion of women in the LSPC group responded to having some college experience (51%) compared to the women in the non-LSPC group (28%; $p = .022$). A greater proportion of women in the LSPC group had a close relative who breastfed (79%) compared to 51% of the women in the non-LSPC group ($p = .02$). IPTW balances these differences.

Figure 1 shows the results of the final linear regression model including IPTW to adjust for confounding. The distribution of total weeks of breastfeeding is shown in box plots among the LSPC and non-LSPC groups. The mean number of weeks of breastfeeding for women who received LSPC was 17.7 weeks (range: 12–26 weeks) with a median of 16.5 weeks. The mean number of weeks breastfeeding for those who did not receive LSPC was 9.1 weeks (range: 0–22 weeks; $p < .001$) with a median of 2.75 weeks.

Table 1. Demographic Characteristics and χ^2 Distributions of WIC Participants

Variable	Loving Support Participants	Comparison Group	χ^2 p value
Race			.227
Hispanic	12 (50%)	51 (33%)	
White/Asian	8 (33%)	77 (50%)	
Black/American Indian/Alaska Native	4 (17%)	20 (13%)	
Age of mother (years)			.119
<25	9 (38%)	59 (38%)	
25–35	8 (33%)	71 (46%)	
>35	7 (30%)	20 (13%)	
Education			.022
High school or less	11 (49%)	109 (71%)	
Some college or more	12 (51%)	43 (28%)	
Income			.736
<\$20,000	14 (58%)	104 (68%)	
≥\$20,000	7 (29%)	44 (28%)	
Employment status			.130
Employed full or part-time/student	10 (42%)	98 (64%)	
Unemployed	11 (46%)	54 (35%)	
Marital status			.249
Married or living with a partner	14 (58%)	69 (45%)	
Single/separated/divorced	10 (42%)	82 (53%)	
Type of delivery			.8884
Vaginal	17 (71%)	104 (68%)	
C-section	7 (29%)	40 (26%)	
Know a close relative who breastfed			.017
Yes	19 (79%)	50 (51%)	
No	4 (16%)	62 (44%)	

Mothers who were no longer breastfeeding at the 6-month infant health assessment visit were asked to check all reasons as to why they stopped breastfeeding. Figure 2 depicts these data stratified by receipt of LSPC. Among the LSPC participants, the two most common reasons why mothers discontinued breastfeeding were, “I thought I was not producing enough milk,” and “I felt that breast milk alone did not satisfy my baby.” Although LSPC mothers reported nutrition-related concerns, non-LSPC mothers reported, “I tried, but it was too hard,” “I didn’t want to,” and “My baby had difficulty latching or nursing.”

Figure 1. Total weeks of breastfeeding among LSPC and non-LSPC participants.

Discussion

This study assessed the pragmatic, real-world effectiveness of the LSPC program to lengthen the duration of breastfeeding currently in use at WIC locations in Nevada. Our findings suggest that the LSPC program resulted in a statistically significant 8.6 weeks longer breastfeeding duration after controlling for potential confounding variables and confounding by indication. Furthermore, mothers at locations without peer counselors expressed frustration or discouragement as reasons for breastfeeding cessation such as “I tried, but it was too hard” and “I didn’t want to,” whereas none of the mothers in the *Loving Support* group reported these answers. This difference could be explained by the fact that *Loving Support* peer counselors are trained to support mothers who may not be confident in their ability to breastfeed. Given the two most common reasons why all

Figure 2. Breastfeeding cessation reasons among LSPC and non-LSPC participants.

mothers discontinued breastfeeding was, “I thought I was not producing enough milk” and “I felt that breast milk alone did not satisfy my baby,” this study identified areas the LSPC program could improve upon, specifically in the area of nutrition education.

Over 1.93 million infants participate in WIC nationwide (Bartick & Reinhold, 2010), making this topic important not only from a health perspective but also from a financial perspective. Infants and their mothers can benefit economically; families can save \$1,200–\$1,500 in the infant’s first year of life by following optimal breastfeeding practices (United States Department of Health and Human Services, 2011). If 90% of U.S. families complied with medical recommendations to breastfeed exclusively for 6 months, the United States would save \$13 billion per year and prevent an excess of sudden infant deaths (Bartick & Reinhold, 2010).

Our study results support research investigating other peer counseling programs’ success among Latina, Brazilian, and Canadian mothers (Chapman, Morel, Anderson, Damio, & Pérez-Escamilla, 2010; Dennis, Hodnett, Gallop, & Chalmers, 2002; Leite, Puccini, Atalah, Alves Da Cunha, & Machado, 2005). These mothers who received peer counseling had a significantly longer duration of breastfeeding and were less likely to rate their feeding experience as dissatisfying.

Although the strength of this study includes the real-world setting among WIC clients and staff and potential generalizability to other WIC programs, there are some limitations. This study did not examine exclusive breastfeeding duration because mothers are told to introduce solid foods at 4–6 months of age depending on the infant’s needs despite the *Healthy People 2020* recommendation of exclusive breastfeeding for 6 months (Mayo Clinic, 2017; NCCDPHP, 2014; ODPHP, 2016). The inclusion of data regarding the introduction of solid foods could be a topic of future research. Although we had relatively small participant numbers at the WIC LSPC locations, this study was powerful enough to detect the effect sizes present (8.6-week difference) at the 5% type 1 error rate. One of the randomly selected non-LSPC WIC sites made up 70% of the entire study population, which made the sample size for the non-LSPC group much larger than the LSPC group. This study was limited to variables available in the dataset. For example, we did not know intrinsic motivators such as mother’s intention to breastfeed. Over 80% of women initiate breastfeeding in Nevada, and an even higher proportion intend to breastfeed but do not due to infant hospitalization, breast milk insufficiency, or insufficient glandular tissue (NCCDPHP, 2014; ODPHP, 2016). Thus, the small proportion that did not intend to

breastfeed most likely did not impact inclusion or exclusion into the intervention group. Furthermore, research suggests an intention to breastfeed is highly associated with mother’s education and age, which we included as adjustment variables. WIC staff collected data during the normal course of their duties, rather than trained researchers. However, we do not expect that missing or incorrect data would not have been differentially missing or incorrect, potentially causing biased results.

These results can inform the development and improvement of similar LSPC programs. For example, peer counselors could be made aware of mothers’ potential concerns related to infants’ nutritional uptake so that they could address these issues through education or referrals before mothers decide to discontinue breastfeeding. At WIC programs where peer counseling is not yet available, program staff could provide mothers with educational materials that address the most frequently mentioned reasons for stopping breastfeeding.

Peer counselors should be informed of the effectiveness of their work. To improve justification and expansion of LSPC programs, WIC should include protocols requiring WIC staff to actively follow up with participants and document the fidelity of program implementation. Standardization of protocols was also recommended for an evaluation of a Michigan peer counseling program (Meier, Olson, Benton, Eghtedary, & Song, 2007).

The LSPC program has been found to be an effective tool to increase breastfeeding duration among Nevada WIC participants. The LSPC program appeared to reduce frustration as a reason for breastfeeding cessation. Improvements in the LSPC program should be to address the mother’s concerns regarding the infant’s nutritional needs.

References

- Anderson, A. K., 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. <http://dx.doi.org/10.1001/archpedi.159.9.836>
- Austin, P. C., & Stuart, E. A. (2015). Moving towards best practice when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies. *Statistics in Medicine*, 34(28), 3661–3679. <http://dx.doi.org/10.1002/sim.6607>
- Bartick, M., & Reinhold, A. (2010). The burden of suboptimal breastfeeding in the United States: A pediatric cost analysis. *Pediatrics*, 125(5), e1048–e1056. <http://dx.doi.org/10.1542/peds.2009-1616>

- Bortree, L., Decher, L., & Flynn, K. (2013). Supporting long-term breastfeeding with the new WIC food packages: You can do it / WIC can help. Retrieved from https://wicworks.fns.usda.gov/wicworks/Sharing_Center/VT/BFSPG/VT_WIC-SPG_Final-Report.pdf
- Brookhart, M. A., Schneeweiss, S., Rothman, K. J., Glynn, R. J., Avorn, J., & Stürmer, T. (2006). Variable selection for propensity score models. *American Journal of Epidemiology*, 163(12), 1149–1156. <http://dx.doi.org/10.1093/aje/kwj149>
- Chapman, D. J., Damio, G., & Pérez-Escamilla, R. (2004). Differential response to breastfeeding peer counseling within a low-income, predominantly Latina population. *Journal of Human Lactation*, 20(4), 389–396. <http://dx.doi.org/10.1177/0890334404269845>
- Chapman, D. J., Morel, K., Anderson, A. K., Damio, G., & Pérez-Escamilla, R. (2010). Breastfeeding peer counseling: From efficacy through scale-up. *Journal of Human Lactation*, 26(3), 314–326. <http://dx.doi.org/10.1177/0890334410369481>
- Cole, S. R., & Hernán, M. A. (2008). Constructing inverse probability weights for marginal structural models. *American Journal of Epidemiology*, 168(6), 656–664. <http://dx.doi.org/10.1093/aje/kwn164>
- Dennis, C. L., Hodnett, E., Gallop, R., & Chalmers, B. (2002). The effect of peer support on breast-feeding duration among primiparous women: a randomized controlled trial. *CMAJ: Canadian Medical Association Journal*, 166(1), 21–28.
- Glasgow, R. E. (2013). What does it mean to be pragmatic? Pragmatic methods, measures, and models to facilitate research translation. *Health Education & Behavior*, 40(3), 257–265. <http://dx.doi.org/10.1177/1090198113486805>
- Glynn, R. J., Schneeweiss, S., & Stürmer, T. (2006). Indications for propensity scores and review of their use in pharmacoepidemiology. *Basic Clinical Pharmacology Toxicology*, 98(3), 253–259. <http://dx.doi.org/10.1111/j.1742-7843.2006.pto.293.x>
- Leite, A. J., Puccini, R. F., Atalah, A. N., Alves Da Cunha, A. L., & Machado, M. T. (2005). Effectiveness of home-based peer counselling to promote breastfeeding in the northeast of Brazil: A randomized clinical trial. *Acta Paediatrica*, 94(6), 741–746. <http://dx.doi.org/10.1080/08035250410023854>
- Mayo Clinic. (2017). Infant and toddler health: When's the right time to start feeding a baby solid foods? Answers from Jay L. Hoecker, M.D. Retrieved from <https://www.mayoclinic.org/healthy-lifestyle/infant-and-toddler-health/expert-answers/starting-solids/faq-20057889>
- Meier, E. R., Olson, B. H., Benton, P., Eghtedary, K., & Song, W. O. (2007). A qualitative evaluation of a breastfeeding peer counselor program. *Journal of Human Lactation*, 23(3), 262–268. <http://dx.doi.org/10.1177/0890334407303892>
- National Center for Chronic Disease Prevention and Health Promotion. (2014). Breastfeeding report card. Retrieved from <https://www.cdc.gov/breastfeeding/pdf/2014breastfeedingreportcard.pdf>
- Office of Disease Prevention and Health Promotion. (2016). Maternal, infant, and child health. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives>
- Oliveira, V., Racine, E., Olmsted, J., & Ghelfi, L. (2015). *The WIC program: Background, trends and issues*. Washington, DC: United States Department of Agriculture.
- United States Department of Agriculture. (2015). *WIC breastfeeding peer counseling study: Phase II follow up implementation report*. Alexandria, VA: Author.
- United States Department of Agriculture. (2017). Loving Support: About WIC breastfeeding peer counseling. Retrieved from <https://lovingsupport.fns.usda.gov/content/about-wic-breastfeeding-peer-counseling>
- United States Department of Health and Human Services. (2011). The Surgeon General's call to action to support breastfeeding: Fact sheet. Retrieved from <https://www.surgeongeneral.gov/library/calls/breastfeeding/factsheet.html>
- Westreich, D., Cole, S. R., Funk, M. J., Brookhart, M. A., & Stürmer, T. (2011). The role of the c-statistic in variable selection for propensity score models. *Pharmacoepidemiology and Drug Safety*, 20(3), 317–320. <http://dx.doi.org/10.1002/pds.2074>
- Yun, S., Liu, Q., Mertzlufft, K., Kruse, C., White, M., Fuller, P., & Zhu, B. P. (2010). Evaluation of the Missouri WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) breast-feeding peer counselling programme. *Public Health Nutrition*, 13(2), 229–237. <http://dx.doi.org/10.1017/S1368980009990668>

Acknowledgments. The authors acknowledge the support of Lyndsey Dermid-Gray, MPH, CLC, Statewide Breastfeeding Coordinator, WIC Program, and the WIC programs that participated in the study.

Helen See, MPH, completed this research as a graduate student under Faculty Advisor Julie Smith-Gagen at the School of Community Health Sciences at University of Nevada, Reno. Helen also served as a graduate research assistant for Elizabeth Christiansen, PhD, who works as the Director of the Center for Program Evaluation in the School of Community Health Sciences.

Julie Smith-Gagen, MPH, PhD, is an Associate Professor at the University of Nevada, Reno. As an epidemiologist, her work uses epidemiology to inform health policy to promote equity in utilization and access to health-care. Her area of focus include women's health including breastfeeding, as well as cancer and health disparities. Dr. Smith Gagen has published in many peer-reviewed high impact journals including *Statistical Methods in Medical Research*, *Journal of Epidemiology and Community Health*, *Psycho-Oncology*, *Journal of Cancer Research and Clinical Oncology*, *Cancer Causes, and Control* and *Women's Health*.

Robin Hollen, MEd, BSN, RN, IBCLC, FILCA, is a graduate student in a Family Nurse Practitioner Program and a nurse Lactation Consultant at a local hospital serving both in- and out-patients. She serves on the ILCA professional development team reviewing continuing education programs and as an advisory committee member for the International Milk Bank. She has received the Nevada Women of Achievement Award for her work in lactation and earned the FILCA designation.

Larissa L. White graduated with a degree in English in 2010, a Masters of Public Health in 2016 and is currently a PhD candidate in Epidemiology, all at the University of Nevada, Reno. She has worked at the Nevada Division of Public & Behavioral Health for the Chronic Disease & HIV Wellness Initiative. She is currently funded by Renown Health to evaluate a new initiative for diabetic patients, The Limb Preservation Service, collaborating with the orthopedist Dr. Gregg Lundeen.

Elizabeth Christiansen, PhD, is the Director of the Center for Program Evaluation, School of Community Health Sciences, University of Nevada, Reno. Dr. Christiansen has more than 20 years of experience in program evaluation and assessment, working with numerous local, state and national evaluation projects in the areas of health and wellness, community and family services, and education and youth development.