

# Effect of Components of a Workplace Lactation Program on Breastfeeding Duration Among Employees of a Public-Sector Employer

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**Abstract** The purpose of this study was to evaluate the impact of the individual services offered via a workplace lactation program of one large public-sector employer on the duration of any breastfeeding and exclusive breastfeeding. Exclusive breastfeeding was defined as exclusive feeding of human milk for the milk feeding. A cross-sectional mailed survey approach was used. The sample ( $n = 128$ ) consisted of women who had used at least one component of the lactation program in the past 3 years and who were still employed at the same organization when data were collected. Descriptive statistics included frequency distributions and contingency table analysis. Chi-square analysis was used for comparison of groups, and both analysis of variance (ANOVA) and univariate analysis of variance from a general linear model were used for comparison of means. The survey respondents were primarily older, white, married, well-educated, high-income women. More of the women who received each lactation program service were exclusively breastfeeding at 6 months of infant age in all categories of services, with significant differences in the categories of telephone support and return to work consultation. After adjusting for race and work status, logistic regression analysis showed the number of services received was positively related to exclusive breastfeeding at 6 months and participation in a

return to work consultation was positively related to any breastfeeding at 6 months. The study demonstrated that the workplace lactation program had a positive impact on duration of breastfeeding for the women who participated. Participation in the telephone support and return to work consultation services, and the total number of services used were related to longer duration of exclusive and/or any breastfeeding.

**Keywords** Breastfeeding · Breastfeeding duration · Workplace lactation program · Public-sector employer

Maternal employment has been described as a barrier to breastfeeding in numerous studies across many countries and cultures [1–12]. The United States Department of Health and Human Services Blueprint for Action on Breastfeeding [13] singled out the workplace as one of the most important barriers to extended breastfeeding for women in the U.S. The blueprint noted that about 70% of employed women in the U.S. who have children less than 3 years of age work full time. Of these women, about one-third return to work within 3 months of their infants' birth and about two-thirds return within 6 months of their infants' birth. In 2003, only 39% of all mothers in the United States were still breastfeeding at 6 months postpartum [14]. By 2006, the latest year for which we have national data, the percentage had only risen to 43% [14]. The American Academy of Pediatrics recommends that babies breastfeed exclusively for the first 6 months of life and continue breastfeeding during the first year of life and beyond with the addition of complementary solid food feedings rich in iron beginning at 6 months [15].

Although the numbers remain small, some workplaces in the U.S. have begun to provide accommodation for

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women to continue to breastfeed or collect milk after they return to work. Workplace lactation programs are a relatively new phenomenon, with the first programs in the country developed in the late 1980's. Although there is no universally accepted construct of a workplace lactation program, the term generally applies to a program in a workplace setting which has the purpose of providing education and professional support to women who wish to continue providing breast milk to their babies after they return to work [16, 17].

According to the Society for Human Resource Management (SHRM), 5% of businesses offered lactation support services in 2009; 25% said that they offered an onsite room for lactating mothers to express milk. In addition, 43% of the SHRM survey respondents reported that their organizations offered flexible, rather than only assigned, breaks [18]. A number of workplace lactation programs have been described in the literature [19–26]. All have reported breastfeeding duration rates for mothers participating in the program that were well above the national average. However, none examine the impact on breastfeeding duration of the individual services included in a workplace lactation program.

The purpose of this study was to evaluate the impact of each of the individual services offered via a workplace lactation program of one large public-sector employer on the duration of breastfeeding.

The Institutional Review Board at Union Institute & University approved the study design and the Privacy Act Officer at the employer approved the conduct of the study for the institution.

## Methods

### Description of the Program

The workplace lactation program that was the subject of this study has been in operation in this large public sector employer since 1998. Two board-certified lactation consultants, who are also registered nurses, provide services to over 300 women each year (women participate for an average of about 9 months) on a large multiple building campus that also includes satellite locations in several nearby communities. Data were not available on the general demographic composition of the employees at the study site.

Lactation services available through the program were these: (1) prenatal classes on how to breastfeed a baby and how to maintain the breastfeeding relationship after return to work; (2) telephone support available from the nurses for new mothers while they were on maternity leave; (3) a return to work consultation with the nurses either in person

or on the telephone concerning maintenance of breastfeeding after return to work; and (4) access to lactation rooms. Ongoing support from the nurses while the women were back at work was also included in the services but was not analyzed for this paper. Special lactation rooms, equipped with large electric breast pumps, were available in many but not all of the buildings. Women were guided to the closest lactation room available to their worksite or made their own arrangements if an official lactation room was not available in their building. All women working on the campus of this employer were eligible to participate in the workplace lactation program.

### Sample

The study population consisted of women who had finished participating in the workplace lactation program within the 3 years previous to the start of the study and who were still employed by the organization. Although 598 women had completed the program during the study period, only 305 met the criterion of continuing as employees of the organization. All eligible program participants were included in the study because of the small size of the group.

### Data Collection

A cross-sectional survey approach was used to collect the data for this study. In April 2005, all qualifying women were mailed a questionnaire. The questionnaire was developed from breastfeeding and nutrition questions contained in the U.S. Food and Drug Administration's Infant Feeding Practices Study II, and the demographic questions were drawn from the U. S. Census 2000. Questions were in some cases modified to make them specific to the program being evaluated. The U.S. Food and Drug Administration questions were chosen because of their relevance to the subject matter and the extensive testing process conducted by that organization on the questions. The questionnaire gathered information about participants' socio-demographic characteristics, program participation, breastfeeding practices, problems encountered while they were program participants, and program satisfaction. The 3 year time span could create the possibility of recall bias. However, a recent study found that maternal recall is a valid and reliable estimate of breastfeeding initiation and duration, especially when the duration of breastfeeding is recalled after a short period ( $\leq 3$  years) [27]. One week after the mailing of the questionnaire, a follow up e-mail was sent to everyone who had received a questionnaire reminding them to complete and return the questionnaire. No other reminders were sent.

Two questionnaires were returned as undeliverable, leaving 303 program participants in the sample.

Questionnaires were completed by 134 program participants for an overall response rate of 44% of eligible participants. Two of the questionnaires had to be omitted from the analysis because they lacked answers to key questions, and four questionnaires were omitted from the analysis because they arrived well after the completion of the analysis, leaving 128 questionnaires that were part of the analysis. This resulted in a useable response rate of 42%.

### Variables

The outcome variables were duration of any breastfeeding and of exclusive breastfeeding, defined as feeding breast milk as the exclusive milk feeding. Solid food feedings were not included as a criterion. The questionnaires did not ask if infants consumed any water, juice or other liquids. Breastfeeding was defined as the feeding of human milk directly from the breast or as expressed milk. Exclusive breastfeeding was dichotomized as less than 6 months versus greater than or equal to 6 months and duration of any breastfeeding was also divided into less than 6 months and greater than or equal to 6 months. The study variables comprised the four program components listed above and also the number of components the respondent used. Control variables were chosen because they have been shown in the literature to be significantly related to duration of breastfeeding. These included mother's age at delivery, white or nonwhite race and whether the mother worked part-time or full-time. The variable income was not included in the regression analysis because the majority of the study participants had incomes over \$100,000, placing them in a demographic group that research has consistently shown has a longer duration of breastfeeding. The same rationale was used in eliminating education as a study variable since a majority of the participants had a college education, and many had masters or doctoral degrees. The variable race was dichotomized because the racial groups, other than white, included too few members for meaningful analysis.

### Data Analysis

Descriptive statistics included frequency distributions and contingency table analysis. Chi-square analysis was used for comparison of groups in the cross tabulations, and both analysis of variance and univariate analysis of variance from a general linear model were used for comparison of means. Logistic regression analysis was used to examine the relationship between duration of total breastfeeding and the demographic variables and program components. All of the independent variables were dummy-coded before addition to the model. Significance level was set at  $P \leq .05$ . Data were analyzed using the Statistical Package for the Social Sciences version 17.0.

## Results

### Demographic Information and Milk Feeding Description

Demographic information about the survey participants is reported in Table 1. The survey respondents were primarily older (mean age 34.4 years, range 25–46 years), white, married, well-educated, high-income mothers compared with estimates from a random sample of new mothers [28]. The mean duration of breastfeeding for all respondents was 10.4 months; 57% of respondents were exclusively feeding breast milk for milk feedings at 6 months.

### Program Participation and Duration of Exclusive Breastfeeding

Employees could register for the workplace lactation program at any time before or after the birth of their baby. Most participants (71%) enrolled before the birth. Program participants chose which components of the lactation program to participate in, and the questionnaire asked them to identify which components they had used. The lactation room and telephone support were the services used by the most participants (Table 2).

The study asked which program components were associated with longer exclusive and total breastfeeding duration. Women who registered for the lactation program before their baby's birth were more likely to be exclusively breastfeeding when their baby was 6 months of age than the women who enrolled in the program around the time they returned to work. More of the women who received each lactation program service (except prenatal education) were exclusively breastfeeding at 6 months of infant age, with significant differences noted in the categories of telephone support and return to work consultation. Return to work consultation was also significantly and positively related to duration of any breastfeeding at 6 months (Table 2). Women who enrolled in the lactation program before their babies were born were more likely to have received both of these services. In order to explore the possibility that other variables explain these findings, exclusive breastfeeding at 6 months or not and any breastfeeding at 6 months or not were compared on the characteristics of mother's age, marital status, race, education level, household income, working part-time versus full-time. No significant differences were found for exclusive breastfeeding, but mothers who were white or working part time were more likely to feed their infant any breast milk at 6 months (Table 1).

Respondents differed in the number of services they reported receiving from the program, with the percentages receiving each number similar (Table 2). The mean

**Table 1** Demographic characteristics of respondents

Characteristic	Total N (%)	Ex. BF 6 mo N (%)	Any BF 6 mo N (%)
Marital status			
Married	124 (97%)	71 (57.3%)	108 (87.1%)
Not married	4 (3%)	2 (50.0%)	2 (50.0%)
Race			
White	88 (70%)	53 (60.2%)	79 (89.8%)*
Non White <sup>a</sup>	38 (30%)	18 (47.4%)	29 (76.3%)
Education level			
Doctoral degree	61 (48%)	32 (52.5%)	54 (88.5%)
Masters degree	26 (20%)	15 (57.7%)	24 (92.3%)
Bachelors degree	25 (20%)	15 (60.0%)	19 (76.0%)
Some college or tech school	13 (10%)	9 (69.2%)	11 (84.6%)
High school diploma or less	1 (2%)	0 (0.00%)	0 (0.00%)
Household income			
<\$100,000	38 (31%)	19 (50.0%)	31 (81.6%)
\$100,000–149,999	49 (40%)	32 (65.3%)	43 (87.8%)
\$150,000 or more	35 (29%)	18 (51.4%)	31 (88.6%)
Work status			
Part time (<35 h/wk)	31 (24%)	19 (61.3%)	30 (96.8%)*
Full time (35 h/wk or more)	97 (76%)	54 (55.7%)	80 (82.5%)
Mother's age at delivery (mean, SD)	34.4, 4.0	34.1, 3.8	34.5, 4.0

\*  $P < .05$  (1 sided)<sup>a</sup> Nonwhite included Black, Latina and Asian

number of services received overall was 2.4. The percentage of respondents who were exclusively breastfeeding at 6 months increased with each additional service received. Respondents who received three or more program services were more likely than not to be exclusively breastfeeding at 6 months. In addition, women who participated in three program services had the longest mean duration of breastfeeding of 11 months, although no significant difference was found in mean duration of breastfeeding between the groups by number of services received ( $F_{(3,124)} = .270$ ,  $P = .847$ ). In regression analysis, after adjusting for race and work status, we found that the number of services received was positively related to exclusive breastfeeding at 6 months and that having received a return-to-work consultation was positively related to any breastfeeding at 6 months. Thus, after adjusting for potentially confounding demographic characteristics, these program elements were positively associated with breastfeeding success (Table 3).

## Discussion

Several recent studies have looked at the factors that influence the duration of breastfeeding for women who have returned to work [1–3, 24, 25, 28–32, 34, 35]. Return to work was shown in most of these studies to decrease

duration of breastfeeding, unless the study was reporting on working mothers enrolled in an employer-sponsored lactation program [19, 24, 25]. This analysis was part of a larger study to evaluate the impact of a workplace lactation program in one large public-sector employer on the duration of breastfeeding after the birth of an infant for employed mothers. The study was designed to compare different services provided by the program in an attempt to determine the relationship, if any, between receipt of the service and duration of breastfeeding. Although this was a descriptive study involving a relatively small sample, some interesting patterns emerged from the data.

The employees who participated in this workplace lactation program were primarily older, white, married, well-educated, high-income mothers—characteristics that research has shown to be most likely to breastfeed successfully [31, 34]. Although they were all at risk of having a shorter duration of breastfeeding because they returned to work [3, 31], there is evidence that participation in the workplace lactation program assisted them in prolonging breastfeeding and that certain program components were more helpful than others.

The data analysis showed that more of the women who joined the lactation program before the birth of their baby were exclusively breastfeeding at 6 months of infant age than those who joined the program around the time they returned to work. It is possible that longer contact with the

**Table 2** Characteristics of sample by program service and by whether mother was exclusively breastfeeding and breastfeeding to any extent at 6 months ( $n = 128$ )

Variable	Total sample	Exclusive BF 6 months	Sig. ( <i>P</i> )	Any BF 6 months	Sig. ( <i>P</i> )
Registered for program	128	73 (57%)		110 (85.9%)	
Time registered			<.05		NS
Before birth	91 (71.1%)	57 (62.6%)		76 (83.5%)	
Around RTW	37 (28.9%)	16 (43.2%)		34 (91.9%)	
Service received					
Prenatal education					
Yes	54 (42%)	31 (57.4%)	NS	44 (81.5%)	NS
No	73 (58%)	42 (57.5%)		66 (90.4%)	
Telephone support					
Yes	86 (67%)	54 (62.8%)	<.05	72 (83.7%)	NS
No	42 (33%)	19 (45.2%)		38 (90.5%)	
RTW consultation					
Yes	75 (59%)	51 (68.0%)	<.05	69 (92.0%)	<.05
No	53 (41%)	22 (41.5%)		41 (77.4%)	
Lactation Rm					
Yes	97 (76%)	58 (59.8%)	NS	86 (88.7%)	NS
No	31 (24%)	15 (48.4%)		24 (77.4%)	
# Services received			<.05		NS
1	31 (24%)	13 (41.9%)		26 (83.9%)	
2	34 (27%)	16 (47.1%)		29 (85.3%)	
3	39 (31%)	26 (66.6%)		33 (84.6%)	
4	24 (19%)	18 (75.0%)		22 (91.7%)	
Mean	2.4	2.67		2.45	

Note: Chi-square was used to compare groups. Exclusively breastfed babies may have received some solid food, water or other liquids. RTW return to work

**Table 3** Logistic regression analysis for exclusive breastfeeding at 6 months and any breastfeeding at 6 months ( $n = 126$ )

Variable	Exclusive breastfeeding at 6 months			Any breastfeeding at 6 months		
	<i>B</i>	Adjusted odds ratio	<i>P</i>	<i>B</i>	Adjusted odds ratio	<i>P</i>
White (vs. non white)	.52	1.69	.20	.86	2.36	.12
Worked part-time (vs. part-time)	.35	1.42	.43	-1.80	6.05	.09
Number of program services received	.55	1.73	.003	-	-	-
Return-to-work consultation (yes vs. no)	-	-	-	1.15	3.15	.04

Note: Nagelkerke  $R^2 = .12$  for exclusive breastfeeding at 6 months; Hosmer and Lemeshow Chi-square, 9.02,  $df = 7$ ,  $P = .25$   
 Nagelkerke  $R^2 = .18$  for any breastfeeding at 6 months; Hosmer and Lemeshow Chi-square, 5.43,  $df = 5$ ,  $P = .37$

program contributed to the more favorable outcome or that early contact with the program provided help at critical early stages of breastfeeding. In addition, more of the women who received each lactation program service were exclusively breastfeeding at 6 months of infant age, with significant differences noted in the categories of telephone support and return to work consultation. It is possible that advice on the best techniques for collecting and storing their milk at work led to longer exclusive breastfeeding duration.

These findings are consistent with those from other studies of the impact of workplace lactation programs on duration of breastfeeding [19, 24, 25]. Although these studies did not attempt to identify which program service appeared to be most closely associated with longer duration of breastfeeding, all included counseling about return to work issues before the woman returned to work and all showed prolonged duration of breastfeeding. These results are also consistent with studies of the impact on breastfeeding duration of individualized professional support

[36–38], and they support the recommendations of the U. S. Preventive Services Task Force on “behavioral interventions to promote breastfeeding” [39]. The findings also demonstrate the value of the workplace lactation program in promoting a longer duration of breastfeeding for women who work outside the home.

There are a number of limitations of the study. The study had a small sample size and this, along with the homogeneity of the group, makes it difficult to generalize the results to other populations. The study design did not include a comparison group, so information is not available about the duration of breastfeeding for women who worked for the organization but did not participate in the workplace lactation program or for breastfeeding duration before the program began. Information concerning the demographic characteristics of the employee population in general and the number of births by employees each year was not available, so it could not be determined how representative the group surveyed was of the worksite population as a whole or what percentage of the eligible employees participated in the program. The questionnaire required the women to remember details about their breastfeeding experience and program participation that may have occurred 3 years prior to the data collection, thus creating the possibility of recall bias.

It is possible that the women who participated in the workplace lactation program were those who were more motivated to breastfeed or intended to breastfeed longer than most employees. However, the study design did not include pre-measures of respondents to obtain measures of motivation or intention so this alternative explanation cannot be explored. The lack of general demographic data about employees at this workplace coupled with the lack of information about motivation or intention of the program participants limits comparisons to national and state data rather than comparisons with similar employees before the program was initiated or with employees not using the program.

Because no data were available concerning the program participants who were not surveyed because they did not meet the study criteria of being currently employed by the organization, it is not possible to determine if they differed from the study population significantly enough to alter the outcome of the study.

## Conclusions

This study was part of a larger study undertaken to evaluate the impact of a workplace lactation program in a large public-sector employer on the duration of breastfeeding for program participants. The study demonstrated that mothers who participated in services before the birth had longer

duration of exclusive breastfeeding than those who waited until after the infant’s birth to join the program. A return to work consultation and telephone support before return to work were both significantly related to longer duration of exclusive breastfeeding, and a return to work consultation was also related to longer duration of any breastfeeding. Regression analysis showed that the number of services received was positively related to exclusive breastfeeding at 6 months and that having received a return-to-work consultation was positively related to any breastfeeding at 6 months.

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