

Effectiveness of a Breastfeeding Program for Mothers Returning to Work in Japan: a quasi-experiment study

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Research

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Abstract

Background: Maternal employment has been described as a barrier to breastfeeding in many countries. In Japan, many mothers quit breastfeeding after returning to work because they do not know how to continue breastfeeding. The primary objective of this study was to investigate the effectiveness of a breastfeeding support program for mothers in Japan by comparing the breastfeeding continuation rate with a control group at 3 months after returning to work. The second objective was to explore the effectiveness of a pamphlet containing information to help mothers returning to work continue breastfeeding by comparing breastfeeding continuation rates in women given the pamphlet and a control group.

Methods: This was a quasi-experimental design study with a program group (n=48), pamphlet group (n=46) and control group (n=47) that took place from February 2017 to August 2018. Participants in the program and pamphlet groups were women who planned to return to work within 4–12 months after giving birth, while the control group included women who had been back at work for at least 3 months. The program involved a 90-min breastfeeding class, a pamphlet, a newsletter, and email consultation. The pamphlet group was sent only the pamphlet, while the control group received no intervention. The outcome was breastfeeding continuation rate at 3 months after returning to work.

Results: The breastfeeding continuation rate 3 months after returning to work was significantly higher in the program group than in the control group (79.2% vs. 51.1%, $p=0.004$). After adjusting for background factors, the program intervention had an effect on breastfeeding rates (adjusted odds ratio=4.68, 95% confidence interval: 1.57–13.96; $p=0.006$). However, comparison of the pamphlet and control groups revealed no significant differences in breastfeeding continuation rates at 3 months after returning to work (69.6% vs. 51.1%, $p=0.07$).

Conclusions: Program intervention resulted in a significant increase in breastfeeding continuation rates 3 months after returning to work. Randomized controlled trials are needed to make this program applicable in practice. Pamphlet intervention resulted in no significant difference, but the proportion of breastfeeding continuation was high; therefore, further study is necessary after examining the contents of the pamphlet.

Background

The benefits of breastfeeding for mothers and infants are widely recognized [1, 2]. Nevertheless, early cessation of breastfeeding is common in many developed countries [2, 3]. Maternal employment has been described as a barrier to breastfeeding in numerous studies across many countries and cultures and the challenge of juggling breastfeeding and employment has been identified as a barrier to continuation of breastfeeding [2, 4].

Factors affecting working women's continued breastfeeding include early return to work or timing of return to work, maternal behaviors and characteristics, support at the workplace [2, 5], policy and law [5]. Specifically, returning to work earlier than 6 months postpartum has been identified as a workplace barrier

[5, 6]. Type of employment, lower workload [7], shorter working hours [2, 5, 7, 8], increasing maternal age, higher education level [5, 7-9], and mother's positive attitude towards breastfeeding [5] have been related to longer duration of breastfeeding. Workplace lactation support enhances working mothers' capacity to continue breastfeeding with employment [5, 10]. A dedicated lactation room, allowance of breast pumping breaks [3, 5, 7], availability of a refrigerator [10], and encouragement from colleagues and supervisors to take breast pumping breaks have been cited as workplace supports [5, 11]. Labor policy on job-protected maternity/paternal leave has the potential to positively influence the duration of exclusive breastfeeding [5, 6, 12]. Work environment strategies targeted at mothers themselves, such as providing options for extended maternity leave and part-time work, and childcare options such as on-site childcare may act as facilitators for breastfeeding continuation [3].

Providing a lactation space and breastfeeding breaks were the two most common breastfeeding supports reported in a previous systematic review [3]. One intervention showed that in person or telephone return-to-work consultations were related to longer duration of breastfeeding [4]. It was suggested that the more support available for mothers, the better the chances of continued breastfeeding [3, 10]

In Japan, many mothers stop breastfeeding shortly after returning to work or before returning to work [13]. After returning to work, the rate of breastfeeding decreases from 44.2% to 7.0% and the rate of infant formula use increases from 7.0% to 46.5% [14].

The situation of childbirth and return to work in Japan is different from that in other countries. Hospital stay for childbirth is usually 5 days for vaginal delivery. After discharge, if mothers want to receive midwifery support for breastfeeding, they must go to a paid outpatient clinic. Breastfeeding rates have been on the rise for the past 10 years, with 2015 breastfeeding rates reaching 48.4% at 0 months, 51.3% at 1 month, and 53.8% at 6 months [15]. However, in Japan, the term "breastfeeding rate" does not refer to the rate of exclusive breastfeeding. Breastfeeding a baby at the time of the survey is adequate to be considered "breastfeeding". The number of working women is on the rise, and the number of women who continue working after their first childbirth has increased [16]. In Japan, up to 2 years of childcare leave can be taken after an 8-week maternity leave. According to 2015 statistics, about 35% of women have returned to work within 1 year of giving birth [17]. Breastfeeding support for working women is expected to become increasingly important in the future.

The primary objective of this study was to investigate the effectiveness of a breastfeeding support program for mothers by comparing the breastfeeding continuation rate with a control group at 3 months after returning to work. The secondary objective was to explore the effectiveness of a pamphlet containing information to help mothers returning to work continue breastfeeding by comparing breastfeeding continuation rates in women given the pamphlet and a control group.

Methods

Study design

This study used a quasi-experimental design with a program group, pamphlet group and control group in an urban area of Japan, and was conducted from January 2016 to August 2018. The framework of the program was transformative learning [18], an adult learning theory, and empowerment [19]. The program involved a breastfeeding class (90 min), use of a pamphlet, distribution of a newsletter upon returning to work, and email consultation up to 3 months after returning to work. The pamphlet group was sent the same pamphlet that was used in the program group but no other information. The control group received no intervention.

Description of the breastfeeding support program

The program involved a 90-min breastfeeding class, a pamphlet, a newsletter, and email consultation. The content of the pamphlet was the same as that used in the pamphlet group. The purpose of the class was to empower women returning to work by providing knowledge about the continuation of breastfeeding, allowing mothers to discuss breastfeeding with their peers, and for mothers to choose to continue breastfeeding after returning to work. Participants reflect on their breastfeeding experience, recognize the value of breastfeeding, and increase their self-efficacy. This leads to the behavior of choosing to continue breastfeeding after returning to work.

Adults have a need to be independent in learning, and often realize the need for learning when trying to fulfill developmental tasks and social roles. It is presumed that the participants of this program who are about to return to work have high learning needs. Transformative learning is the process of critically self-reflecting and questioning values. Each participant had experienced breastfeeding since childbirth. After returning to work, when the mothers spent more time separated from their babies, they thought about what they wanted to do with respect to breastfeeding and what was best for the baby. Through small group discussions, mothers were able to share their feelings and worries with each other.

Peer support is effective for breastfeeding support [20-22]. In the class, participants watched a 10-min video presenting the experience of two women who continued breastfeeding after returning to work. One of them fed her child only breast milk, and the other used mixed nutrition. The video showed mothers' ideas of breastfeeding and the actual conditions before and after returning to work.

The number of participants was limited to 10 people at one time, and group discussions were limited to about five in consideration of group dynamics. The room environment was arranged so that women and infants could relax together. Each class was run by two midwives and two support people with experience in caring for babies. A researcher was in charge of class progress, and another midwife assisted. The two support people took care of the babies and maintained their safety so that the participants could concentrate on the class with confidence. Program participants were able to consult with the researcher by e-mail for up to 3 months before returning to work. A newsletter was sent once to the participants before and once after returning to work. The purpose of the newsletter was to share the results of consultations with the participants and prevent them from dropping out of the study. The newsletter was one double-sided, A4-size page printed in color. The contents included bullet-point advice such as preventing problems regarding continuation of breastfeeding.

Pamphlet structure and contents

The pamphlet contents presented information that could be used before and immediately after returning to work. The pamphlet was in color and consisted of eight, A6-size pages and a cover. The information in the pamphlet included the long term effects of breastfeeding, how to express breast milk, how to take medications while breastfeeding, weaning, laws related to mothers' rights in the workplace and the web address of a breastfeeding support organization. In addition, the pamphlet included examples of two women who continued breastfeeding after returning to work.

The contents of the class and the pamphlet were approved by two midwives with extensive breastfeeding experience. The content validity of the pamphlet was reviewed by two midwifery researchers and two women with breastfeeding experience, and subsequently revised based on their feedback.

Participants and setting

The program group and the pamphlet group included the women who planned to return to work within 4-12 months after giving birth, were breastfeeding at the time of recruitment, and could communicate, read and write in Japanese. The reasons why returning to work after at least 4 months after childbirth were as follows. First, breastfeeding rates in Japan rise up to 4 months after birth and are maintained for up to 6 months [23]. Second, since complementary food is started from the age of 6 months, it was thought that women who did not have enough breast milk could continue breastfeeding while using complementary food. Program group participants were recruited from 7 clinics, 4 health centers, 19 childcare support centers, 5 maternity care houses, and 4 daycares. Pamphlet group participants were recruited from 1 hospital, 1 clinic, 9 childcare support centers, 5 maternity care houses, 5 daycares, and 1 company.

The control group included women who returned to work within 4-12 months after giving birth, had been back at work for at least 3 months, were breastfeeding before returning to work, and could read and write in Japanese. There were no exclusion criteria. Control group participants were recruited from 22 daycare facilities. In Japan, it is not common for mothers to receive breastfeeding support before returning to work. Therefore, we believe that the breastfeeding status of mothers who had already returned to work reflects the general breastfeeding status.

Variables

The outcome was breastfeeding continuation rate at 3 months after returning to work. In this study, breastfeeding continuation was defined as breastfeeding at least once a day. The sample size was calculated assuming that the rate of breastfeeding continuation after returning to work was 60% and 30% in the program and control groups, respectively, and that the difference between the two groups was 30%. A priori power analysis was performed using two-sided analysis with an α error of 0.05 and a power of 0.8. Forty-two participants were needed for each group [24].

The demographic variables were follows: maternal age, month of birth, parity, employment status, education level, smoking status, and previous breastfeeding experience. Breastfeeding-related variables

were timing of return to work postpartum, working hours per day, partner's support in child care, presence of a peer to assist with breastfeeding, consultation with midwives, and workplace environment for breastfeeding (milk expression breaks, lactation room, refrigerator to store breast milk), and daycare environment for breastfeeding (acceptance of expressed milk). Mothers were also asked about types of breast milk, with response choices of breast milk only, infant formula only, and mixed.

Data analysis

Data were analyzed using descriptive statistics. One-way analysis of variance was used for continuous variables. The chi-square analysis was used for comparison of categorical variables. When the expected frequency was 5 or less, Fisher's exact test was performed. Logistic regression analysis was used to examine the relationship between breastfeeding continuation rates and demographic variables. The dependent variable was the breastfeeding continuation rate at 3 months after returning to work, and the intervention variable was the program intervention. There were eight independent variables: maternal age, timing of return to work, working hours per day, education level, breastfeeding experience, partner's support in child care, presence of a peer to assist with breastfeeding, and consultation with midwives. Statistical analyses were conducted using SPSS version 25.0 with a two-sided 5% level of significance.

Ethical considerations

This study was approved by the Research Ethics Committee of St. Luke's International University (No. 16-A076) and Kanagawa University of Human Services (No. 10-57). The participants provided written informed consent before study participation.

Results

Program participation and questionnaire collection rate

The program was held 12 times with a total of 52 participants. Three months after returning to work, 52 questionnaires were mailed, and 48 were returned (recovery rate, 92.3%). There were 49 participants in the pamphlet group and 48 questionnaires were collected immediately after the intervention. Three months after returning to work, 48 questionnaires were mailed, and 46 were returned (recovery rate, 93.8%). In the control group, a total of 123 questionnaires were mailed to 22 facilities, and 67 were returned (response rate, 54.5%). As a result, 47 sets of valid answers (effective response rate, 70.1%) were obtained. There were 48 participants in the program group, 46 participants in the pamphlet group and 47 participants in the control group for a total of 141 included in the final analyses. Missing values included one maternal age in the control group. Missing values were included in the analyses as missing without substitution.

Demographic characteristics

The characteristics of the participants are shown in Table 1. The mean age was 34.0 years [standard deviation (*SD*)=3.5, *n*=48] in the program group, 34.8 years (*SD*=3.9, *n*=46) in the pamphlet group and 34.2 years (*SD*=3.9, *n*=46) in the control group, with no significant difference (*p*=0.58). Parity status (*p*=0.08)

and previous breastfeeding experience ($p=0.08$) was significantly different among the three groups. Participants in the program group received interventions on average 6.8 months after giving birth ($SD=2.3$), and the pamphlet group on average 8.2 months after giving birth ($SD=2.4$).

The characteristics of breastfeeding after returning to work are shown in Table 2. The average return to work after giving birth was 9.3 months in the program group ($SD=2.6$), 9.9 months in the pamphlet group ($SD=2.3$) and 8.8 months in the control group ($SD=2.5$). The working hours per day were 7.0 ($SD=1.1$) in the program group, 7.3 ($SD=1.2$) in the pamphlet group and 6.9 ($SD=1.0$) in the control group. Consultation with midwives before and after returning to work was significantly different between the three groups ($p=0.03$).

The percentage of daycares that accepted expressed breast milk was low, at 45.8% in the program group, 39.1% in the pamphlet group and 42.6% in the control group. At the workplace, few participants were guaranteed a lactation room and milk expression breaks. Many participants in the program group could make these arrangements by themselves, but the mothers in the control group could not.

Outcome

Primary outcomes are shown in Table 3. The breastfeeding continuation rate at 3 months after returning to work was significantly higher in the program group than in the control group (79.2% vs. 51.1%, $p=0.004$). After adjusting for background factors, the program intervention [adjusted odds ratio (AOR)=4.68, 95% confidence interval (CI): 1.57–13.96; $p=0.006$] and maternal age (AOR=1.20, 95% CI: 1.02–1.40; $p=0.03$) had an effect on breastfeeding rates (Table 4). Secondary outcomes are shown Table 5. The breastfeeding continuation rates at 3 months after returning to work was not significantly differences between the pamphlet group and control group (69.6% vs. 51.1%, $p=0.07$).

In the program group, the mothers could receive consultation with midwives by e-mail. There were eight consultations in six participants ($n=48$, 12.5%). The consultation topics included methods of cessation breastfeeding at night, methods of disinfecting the breast pump at the workplace, nipple troubles, methods of depressing the breast, reduced breast milk secretion, X-rays during lactation and how to deal with infants playing with the nipples.

Discussion

According to 2017 statistics, the average maternal age at birth of the first child is 30.7 years in Japan, and that of the second child is 32.6 years [25]. Even several months after giving birth, the mothers in the present study were older than the national average. In Japan, the proportion of part time and contract employment is rising and in 2018, 56% of working women were not permanent employees [26]. However, there was a high percentage of full-time workers among the present participants, suggesting that it was relatively easy for them to take maternity and childcare leave. Returning to work 6 months after birth is a factor promoting continuation of breastfeeding [5]. The timing to return to work was 9.3 months in the

program group, 9.9 months in the pamphlet group and 8.8 months in the control group. This suggests that timing was a factor promoting breastfeeding continuation.

To the best of my knowledge, this is the first intervention study on breastfeeding continuation among working women in Japan. The breastfeeding continuation rate at 3 months after returning to work was significantly higher in the program group than in the control group. After adjusting for background factors, the program intervention had an effect on breastfeeding continuation rates. It was suggested that this program was effective for the continuation of breastfeeding at 3 months after returning to work. There were three reasons why the intervention was so effective. The first was consultations before returning to work, the second was the combination of professional and peer support, and the third was face-to-face support.

One study suggested that breast management after returning to work, such as expressing breast milk, should be performed during pregnancy or during the postpartum period in the hospital [27]; however, it is difficult to imagine breastfeeding during pregnancy. Before returning to work, there are specific worries about the condition of the breast and the feeding of the infant that mothers want information and advice about. Because the participants in the present study had a high awareness of breastfeeding, they were able to share their worries and feelings with peers who had the same worries in the program class. Midwives provided knowledge and information about breast changes after returning to work, and about common problems that mothers face. For healthy mothers and children born at term, any support provided by professional or lay peer supporters, or a combination of both, is effective in increasing breastfeeding initiation rates [20]. It was speculated that the combination of professional and peer support affected the outcome of the program. Face-to-face support was more effective than telephone support, and provided the opportunity to discuss and respond to the mothers' questions [20]. This program was considered effective because these factors were included. In the class, participants' questions were shared among all group members or answered individually. Such an individual response was possible because of face-to-face support. Returning to work is a major turning point for breastfeeding mothers and children, so it is important to help mothers make choices that they will not regret [22]. If women decide how long and how to continue breastfeeding on their own and make choices they do not regret, they will feel accomplishment in breastfeeding, which will lead to confidence in subsequent childcare.

The proportion of women who secured a lactation room or milk expression breaks at the workplace by themselves was higher in the program and pamphlet groups than in the control group. The percentage of those who could store breast milk at the workplace was also higher in the program and pamphlet groups. Participants in the program group knew how to manage breastfeeding continuation after returning to work, which led to the actual behavior. Conversely, women in the control group were not able to take the same actions. Therefore, it is important to convey knowledge, information, and specific methods in advance to overcome the challenges and barriers to the continuation of breastfeeding after returning to work, and after returning to work, it is important for mothers to be able to deal with such challenges themselves. Expressing breast milk and breastfeeding at the workplace were factors that promoted

continued breastfeeding after returning to work [28]. In Japan, while long childcare leave is available, women who return to work within 1 year after birth often do not have enough support to continue breastfeeding. There is often no lactation room available at the workplace, so many women express in the rest room, and some women discard expressed milk because there is no refrigerator for storage [29]. A working mother's decision to continue or discontinue breastfeeding is highly dependent on the support available to her in the workplace [5]. Thus, a comprehensive strategy is required to encourage the practice of breastfeeding in working women from pregnancy to after returning to work [6, 21]. In order for women returning to work in Japan to continue breastfeeding, it is important that employers and daycares understand and cooperate with women as they continue to breastfeed.

Although the effects of the pamphlet were not statistically observed, the breastfeeding continuation rate 3 months after returning to work in the pamphlet group was 18.5 points higher than that of the control group. The proportion of women who secured a lactation room or milk expression breaks at the workplace by themselves was as high as in the program group. This suggests that obtaining knowledge and information about continuing breastfeeding may lead to the actual behavior in mothers. With respect to cost-effectiveness, use of pamphlets is a good tool for providing knowledge and information.

Limitations and implications

This study had a selection bias because participants were not randomly assigned to the program, pamphlet and control groups, and there was the possibility that mothers with a desire to continue breastfeeding were included in the program and pamphlet groups. Pamphlet intervention resulted in no significant difference, but the proportion of breastfeeding continuation was high; therefore, further study is necessary after examining the contents of the pamphlet.

For practical application, it is necessary to consider cost performance and media, such as computer and smartphone applications suitable for younger generations who will give birth in the future.

Conclusion

Program intervention resulted in a significant increase in breastfeeding continuation rates at 3 months after returning to work; however, pamphlet intervention resulted in no significant difference. Randomized controlled trials are needed to make this program applicable in practice.

List Of Abbreviations

AOR, adjusted odds ratio

CI, confidence interval

SD, standard deviation

Declarations

Ethics approval and consent to participate: This study was approved by the Research Ethics Committee of St. Luke's International University (No. 16-A076) and Kanagawa University of Human Services (No. 10-57). The participants provided written informed consent before study participation.

Consent for publication: Not applicable.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests: The author declares that they have no competing interests.

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Author contributions: KN designed the study, collected and analyzed the data, wrote the manuscript, and approved the final version manuscript.

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Author's information: KN is a Midwife, a Registered Nurse, and a Public Health Nurse, and received a PhD in Nursing Science from the Graduate School of Nursing at St. Luke's International University.

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Tables

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