REVIEW

Breastfeeding : factors associated with the continuation of breastfeeding, the current situation in Japan, and recommendations for further research

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Abstract : There are a number of research reports that address the various advantages that breastfeeding brings to mothers and children, as well as to families and society, and in addition to a number of physically positive effects, breastfeeding has an important role in terms of mental and psychological effects.

Ninety-five % of mothers desire to breastfeed, which reflects social acceptance, but the actual breastfeeding rate of the first month after childbirth is 42%, which accounts for about a half of all mothers. Breastfeeding is a natural behavior, but it cannot be performed only by instinct, so mothers discontinue breastfeeding for various reasons. While these reasons for the discontinuation of breastfeeding have been studied in many countries, research regarding the usability of care to support breastfeeding is being conducted in other countries at a level that can be considered evidential, but not yet in Japan. In addition, the current situation is that breastfeeding is strongly promoted but the support provided remains inadequate for mothers who cannot breastfeed, regardless of whatever efforts they make.

This article will review several factors associated with the continuation of breastfeeding and the current situation in Japan, with the intention of identifying desirable areas for further research. J. Med. Invest. 54 : 224-234, August, 2007

Keywords **:** *breastfeeding, breastfeeding rate, continuation factors, discontinuation factors, evidence based care*

INTRODUCTION

The National Infants Nutrition Survey 2005 by the Ministry of Health, Labor and Welfare reports that 95% of pregnant women hope to breastfeed (1). It can be said that breastfeeding is the desire of many mothers. Breast milk has advantages in its nutritional, immunological, developmental, psychological, societal, economical, and environmental aspects. From the viewpoints of maternal-child health and social security, a number of benefits have been reported (2-9). A Medline query on the keyword "Breastfeeding" resulted in 7,974 hits for articles published in the last decade. The results included 400 hits on randomized trials. On the other hand, Japana Centra Revuo Medicina listed 399 original articles, including two related to randomized trials.

"Sukoyaka Oyako 21," which is currently being developed as a national health policy, also recommends "increasing the breastfeeding rate for the first month after childbirth" (10). Breastfeeding, as it were, has therefore become a major initiative in maternal-child health in the 21st century.

This article will review several factors associated

Received for publication May 31, 2007 ; accepted August 1, 2007.

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with the continuation of breastfeeding and the current situation in Japan, with the intention of identifying desirable areas for further research.

CHANGES IN BREASTFEEDING TRENDS IN JAPAN AND THE PRESENT STATUS

The trend in breastfeeding has changed from almost total breastfeeding in the past to advertisements promoting bottle-feeding in the 1960s, when the sales of artificial milk flourished, and then in the 1970s, bottle-feeding suddenly became a major trend. In order to change the current situation, following the resolution on "Infant Nutrition and Breastfeeding" by the WHO in 1974, breastfeeding has been promoted, since 1975. Furthermore, in 1989, the campaign regarding "Ten steps to successful breastfeeding", which was announced in a WHO/UNICEF joint statement, began to spread across Japan, and it is currently being implemented at a number of hospitals and maternity centers. The number of facilities implementing "Ten steps to successful breastfeeding" and which have been recognized by WHO/UNICEF as being "baby-friendly hospitals" has increased to 28 locations and 43 facilities. Breastfeeding was designated as one of the goals in the aforementioned "Sukoyaka Oyako 21." It can be said that society as a whole has been become interested in breastfeeding, and measures for breastfeeding have gradually and steadily become widespread. Consequently, the breastfeeding rate in Japan has shown a gradual upward tendency, from the 1970s' (31.7% during the first month or two). However, the breastfeeding rate for the first month after childbirth was 42.4% in 2005, which has not yet reached the high breastfeeding rate of the 1960s (70.5% during the first month or two). Changes in the rate of breastfeeding only for the first month after childbirth showed a decline from 49.5% in 1985 and 46.2% in 1995 to 42.4% in 2005. Conversely, the rate for a mixed-feeding and bottle-feeding has been increasing from 41.5% in 1985 to 45.9% in 1995 and 52.5% in 2005. In addition, the rate of bottle-feeding only has been steadily declining from 9.1% in 1985 to 7.9% in 1995 and 5.1% in 2005. This shows that although the breastfeeding rate has been declining, the mixed-feeding rate has been increasing. Accordingly, the rate of breastfeeding of infants has been increasing overall.

The duration of breastfeeding has declined during one month to six months after childbirth. The survey in 2005 shows a decrease in breastfeeding from 46.4% within one month after childbirth, 38.0% within three months, and further to 34.7% within six months. Even in Australia, where the breastfeeding rate is as high as 80-90%, it decreases to 50-60% within three months after childbirth, and 47% within six months (11). Similar changes in the duration of breastfeeding have also been recognized in other countries (12-16).

There is evidence that the breastfeeding ratio varies, depending on the ethnicity, socioeconomic level, and other demographic factors (17-20). In terms of ethnic differences, the breastfeeding rate has been reported to be high among Asians (11, 21). However, regardless of any ethnic variations, there are differences in the efforts to encourage breastfeeding according to the country or local area. Some reports state that all Vietnamese mothers who have immigrated to Western countries choose to bottle-feeding (22). Moreover, a survey conducted in Massachusetts reported that, in comparison to African-American mothers who were born in the U.S. or any other ethnic group, white mothers who were born in the U.S. do not breastfeed their premature babies (23). Currently, in Japan, research on breastfeeding has been conducted with Japanese mothers as the main subjects. According to the Ministry of Justice-Immigration Bureau, the number of foreign residents has been steadily increasing (24). Consequently, the number of cases in which foreign wives deliver in Japan has also been increasing (25). It is desirable to enhance maternal-child health and medical welfare as well as to improve the socioeconomic environment for foreign residents in Japan. Therefore, also in terms of breastfeeding promotion, a future issue to solve in Japan will thus be one of providing support based on the individual's ethnic background.

FACTORS ASSOCIATED WITH THE CONTINUATION OF BREASTFEEDING AND THE CURRENT STATUS IN JAPAN

A number of survey reports have been published regarding the factors associated with the continuation of breastfeeding. These factors vary from country to country, reflecting different influences due to the differences in various circumstances, for example, cultural and socioeconomic factors. The results from a survey conducted in Australia, where the breastfeeding rate is high, indicate that the factors

associated with the continuation of breastfeeding include a very strong desire to breastfeed, having been breastfed oneself as a baby, being born in an Asian country, and an older maternal age. On the other hand, factors that are negatively associated with feeding any breast milk at six months included women having no intention to breastfeed six months or longer, smoking 20 or more cigarettes per day before pregnancy, not attending childbirth training sessions, maternal obesity, having self-reported depression during the six months after childbirth, and a baby receiving infant formula while in the hospital (21). The author (26) described the reasons for the discontinuation of breastfeeding as obtained from mothers, while referring to the concept of dependent-care by nursing theorist Dorothea Orem as a framework. As a result, the following fourteen categories were identified as factors that are negatively associated with the continuation of breastfeeding. Factors that inhibited the continuation of breastfeeding for the first month after childbirth included : "having no prior experience with breastfeeding" ; "giving up due to past experiences" ; "maladaptation caused by recognition of differences between the child that was imagined and the actual child" ; "lack of life experience with children" ; "lack of energy" ; "lack of interest and desire in breastfeeding" ; "inappropriate goal directions and values" ; "inappropriate decision-making" ; "negative influences from family members or others" ; "busy life situation" ; "family or home crisis" ; "breast-related troubles" ; "absence of support" ; and "prenatal depression." A restrictive factor, which was particularly characteristic to the Japanese culture, was negative influences from family members or others. It was found that a home visit after childbirth and family support could interfere with the mother's motivation to breastfeed. Given the fact that family members or others who are supposed to provide support could be potential inhibitors, this was regarded as a notable factor that affects the continuation of breastfeeding.

1) Educational background and socioeconomic status

The breastfeeding rate is positively related to a mother's higher educational level in developed countries (27, 28), whereas there is an inverse relationship in developing countries (29).

Although breastfeeding is positively related to socioeconomic status in most developed countries, there is an inverse relationship in developing countries. Higher income women in these countries may perceive breastfeeding as old-fashioned and a sign of lower social status ; such women bottle-feed to be perceived as modern and "westernized" (30).

In Japan, where a compulsory educational system has been established and the literacy rate is the highest in the world at 99.8%, no surveys have been found that examine differences in the breastfeeding rate based on the mother's educational level. In addition, the correlation between socioeconomic status and the continuation of breastfeeding has also not yet been investigated.

2) Maternal age

Older women (older than 25 years) are more likely to initiate and continue breastfeeding than are younger women (21, 28, 31-33). In Japan, the maternal age has been rising every year. The number of childbearing women by age reaches the highest value at ages 30 to 34, followed by ages 25 to 29, and 35 to 39, in that order. If older women have a higher trendency to breastfeed, then the rise in maternal age in Japan may be a desirable trend for promoting breastfeeding. However, breastfeeding is an activity from which it is not possible to take a break, and is one that requires physical strength, so it cannot simply be said that older women tend to breastfeed more. One wonders whether there is any particular age that is most ideally suitable for breastfeeding.

3) Maternal employment

Working mothers breastfeed for shorter periods of time or not at all (34-36). On the other hand, the length of maternity leave was clearly associated with the continuation of breastfeeding (37). The number of employed females amounted to 27.59 million in 2006 and it has been increasing for four consecutive years (38). The labor force rate by age group is 62.7% for the age group of 30 to 34, which accounts for the highest number of childbearing women and 74.9% for the age group of 25 to 29.9. Among these, the rate for women in fixed-term employment that obtain maternity leave is 51.5% (39). According to the fact that there are an increasing number of employed females who are at maternal age, taking maternity leave after childbirth therefore also affects the breastfeeding rate.

4) Smoking

Mothers who smoke tend to either not breastfeed, or to quickly discontinue breastfeeding (21, 31, 36, 40-42). Women who smoke often quit after

becoming pregnant. However, those who do not intend to breastfeed or those who are under stress after childbirth tend to resume smoking (43, 44). A survey conducted in Brazil reported that mothers who smoke more than ten cigarettes a day tended to stop breastfeeding earlier (40). A survey conducted in Australia reported that mothers who smoke more than twenty cigarettes a day normally discontinued breastfeeding (21, 45). The author's survey also indicated that mothers who smoked believed that it was better to bottle-feed than to breastfeed because of their smoking, and therefore they did not actively breastfeed (26). It has been reported that the urinary cotinine levels in infants who were breastfed by smoking mothers were 5 (46) to 10 (47) times that of infants who were breastfed by non-smoking mothers. Furthermore, smoking inhibits the development of the mammary gland tissue, leading to defects in the secretion of breast milk. The breast milk of breastfeeding women who smoke contains a considerable amount of nicotine (48, 49). Moreover, sleeping alongside a smoking mother and the high-nicotine level of breastfeeding are also risk factors associated with sudden infant death syndrome (50, 51).

According to a report from the Council of Health Sciences (52), the smoking rate in Japan is extremely high in comparison to other developed countries. The rate of male smokers has decreased from 80% in 1965 to approximately 50% in 2005. Conversely, while the rate of female smokers has remained at about 15%, that for women aged 20 to 30 who are at the reproductive age now exceeds 20%. It appears as though smoking has already become an antisocial act. From the viewpoint of second-hand smoke as well as the decrease in the female smoker rate, it is desirable to establish effective support to establish programs that strongly encourage mothers to quit smoking.

5) Maternal obesity and overweight

Women who are overweight during pregnancy tend to not breastfeed (53-57). Overweight/obese women have been reported to have a lower prolactin response to suckling. Therefore, breast milk secretion tend to become deficient earlier than for non-obese women (58). Further research on the endocrine system will be necessary to clarify the correlation between obesity and breast milk secretion deficiency.

6) Postpartum depression

Postpartum depression has been reported to inhibit breastfeeding (21, 59-61). On the other hand, there is a report stating that breastfeeding reduces stress and improves mood (62). In Japan, the incidence of postpartum depression is 13.9% (63). "Sukoyaka Oyako 21" also has been addressing the decrease in incidences of postpartum depression. There are cases in which postpartum depression creates a situation wherein mothers cannot continue breastfeeding and mothers build up anxiety toward breastfeeding due to the difficult situation of breastfeeding, thereby leading to a worsening of postpartum depression.

7) Maternal confidence

(1) Experience

One of the factors may be the mother's positive or negative attitude toward breastfeeding. Their empirical decisions and values have inhibited breastfeeding (26), saying, "I had no breast milk secretion when my elder child was born," or "Since my elder child has been growing well with bottle-feeding, I will not stick to breastfeeding." According to Blyth, mothers who are less confident in breastfeeding tend to discontinue breastfeeding at an earlier time, thus suggesting the importance of a mother's confidence in breastfeeding (64). An experience of failure in breastfeeding decreases a mother's confidence in breastfeeding, and thus breastfeeding consequently appears to be discontinued earlier. Janke also clarified that having no previous experience of breastfeeding can be a predictor for the promotion of breastfeeding (65). On the other hand, some mothers think, "Since I bottle-fed previously, I want to breastfeed this time." Previous experiences can be a limiting factor in some cases, whereas it may enhance a desire for breastfeeding in other cases (26).

(2) Self-efficacy

Self-efficacy refers to the sense of competence and trust in oneself, which is one of the competence factors required to breastfeed. Mothers with high self-efficacy are able to continue breastfeeding (66-69).

(3) Insufficient milk, baby crying

Matsunami's survey, conducted 25 years ago, reported that reasons for mothers deciding to bottle-feed included the "baby crying" and "perceptions of

insufficient milk supply" (70). Konno's survey indicated that puerperal women had anxiety about "fatigue," "perceptions of insufficient milk supply," and "baby crying" (71). Haku's survey also found that conditions inducing the perception of insufficient milk supply included "baby crying," "baby wakefulness," and "not full of milk." In addition, the comments of other people concerning "insufficient milk" further compounded the mothers' perceptions of insufficient milk supply. According to a national survey by Shimada, *et al.*, despite the fact that the majority of mothers were receiving housekeeping assistance after discharge from hospital, problems on the maternal side were identified, including a lack of sleep/fatigue, breast-related troubles, a sense of child neglect, and self-doubt (72, 73). Maternal breastfeeding confidence has also been associated with perceptions of insufficient milk supply (61, 74).

8) Support

Much of the research on breastfeeding has reported the importance of support (75-80). In addition, the WHO has advocated continuous breastfeeding support, including providing knowledge and information, controlling physical/psychological conditions, and promoting the mothers' sense of independence and security (81).

(1) Negative influences from support personnel

According to a report by Horiuchi (82), pediatricians insist that paying excessive attention to breastfeeding is not favorable for the promotion of breastfeeding, however, they regard breastfeeding as being common sense. Some have had negative opinions. It is believed that pediatricians are not sufficiently involved in breastfeeding, and they are not skillful enough to provide appropriate education regarding breastfeeding. The report also mentions the current situation which shows a lack of cooperation among all involved professional, including not only pediatricians but also obstetricians, midwives, public health nurses, and clinical nurses (82). Those who give such negative advice regarding breastfeeding are exemplified as being the husband, mother, mother-in-law, friends, and professionals (26). Tarkka, *et al.* stated that for the continuation of breastfeeding, the attitudes of the husband toward breastfeeding are important, while paying close attention to the mother and child (83-86). In addition, Hill describes that an unfavorable relationship with the mother-in-law can be highly influential on the continuation of breastfeeding (74). On the other hand, a Japanese study reports both stands-that the biological mother's views may affect breastfeeding (87) or may not (88), so no unified view has yet been reached.

EVIDENCE FOR BREASTFEEDING SUPPORT : NEEDS OF RESEARCH BY RCT (RANDOMIZED CONTROL TRIAL)

A Medline search resulted in 45 hits for RCT on breastfeeding in the nursing field for the last decade. On the other hand, no RCT has been conducted in Japan. The theme of RCT were value validation of peer counseling before and after childbirth, educational support including intervention programs, early skin-to-skin contact (kangaroo care) immediately after delivery, instruction regarding how babies suckle breast milk (latch), treatment of nipple problems, and postpartum follow-ups. The following is one example of a value validation regarding support for continued breastfeeding.

1) Sore nipples

(1) Preparation before delivery

Kearney, *et al.* reported that sore nipples accounted for 66% of all issues associated with breastfeeding for the first week after delivery (89) and that mothers often terminated breastfeeding early due to sore nipples (90-94).

In Japan, in order to prevent sore nipples related to breastfeeding after delivery, instructions on breast/nipple care during pregnancy has been provided. In addition, it is said that appropriate nipple care may promote breastfeeding (95, 96). On the other hand, the RCT results indicated that there were no significant differences in either subjective or objective effects of nipple care before delivery among various treatment methods, such as using massage cream, squeezing out the first milk, doing nothing, and so on. Furthermore, neither the Hoffman method nor the breast shield attachment yielded any beneficial treatment effects for retracted nipples or flat nipples in terms of the period of continuation of breastfeeding (97).

(2) Postpartum nipple care

In Japan, mothers who have fissured nipples may be treated by the application of lanolin poultice or ointment. The results from a randomized trials shows that hydrogel dressings are a safe, and widely available treatment that provide more effective pain

management of nipple soreness than the common intervention using lanolin ointment (98). The incidence of sore and cracked nipples and the duration of breastfeeding were not influenced by the use of a nipple ointment (99). No beneficial effects were found in treatments using lanolin cream or glycerin gel (100). Therefore, what is the most effective care for preventing sore nipples? The answer is instruction on feeding techniques (good positioning and latching-on) (99).

The WHO/UNICEF promoted "Ten steps to successful breastfeeding" has clarified evidence for each step (101). In order to provide effective care, it is desirable to conduct randomized trial, which are object studies in which object extraction is systematically performed, and investigation based on a comparative studies (quasi-experimental studies) before and after beginning intervention. However, in Japan, study to inspect efficacy of care is not performed.

THE ISSUE IN BREAST-FEEDING PROMOTION AND RECOMMENDATIONS FOR FURTHER RESEARCH

The trend in breastfeeding has changed from almost total breastfeeding in the past to advertisements promoting bottle-feeding in the 1960s, when the sales of artificial milk flourished, and then in the 1970s, bottle-feeding suddenly became a major trend all at once. According to Sawada's survey, in an era when there was no good-quality artificial milk, not all mothers could breastfeed sufficiently. However, they tried to eat foods to increase breast milk secretion, hope for good breast milk secretion, or ask other lactating women among relatives to breastfeed the baby, which was a common practice called "chitsuke." Efforts toward breastfeeding were made not only by mothers but also by their neighbors and relatives. Before questioning why breastfeeding could not be continued, people dealt with this issue from the perspective of seeking for ways to increase breast milk secretion (102). In the following social climate, some societal limiting factors have emerged, such as discontinuation of breastfeeding due to the promotion of efficient child bearing in accordance with social advancement of women and the search for beauty. Focusing on mother's issues, studies on breastfeeding have been conducted to ascertain reasons for the discontinuation of breastfeeding, and factors related to the child have also been researched. Such factors limiting breastfeeding may vary along with changes of era and change in society. Accordingly, the necessary care will also change.

The midwifery profession is increasingly applying the results of evidence-based research findings. Randomized trials are the "gold standard" in clinical research and provide the strongest evidence for a treatment or intervention (103). But randomized trials have limitations and cannot address all important breastfeeding questions. Research using observational, descriptive, and qualitative methods also has a place in generating evidence for practice. Continued research will add to knowledge about how midwives can support breastfeeding and they can perform woman-centered care.

The issue in breast-feeding promotion : Current breastfeeding support has been strongly promoted to every mother (regardless of whether the mother desires to breastfeed). Prior reference material (104, 105) has demonstrated that stress can decrease breast milk secretion. "Sukoyaka Oyako 21" stipulates in its specific measures and goals that "Mothers who are unable to breastfeed sufficiently should not be pressured by the belief that breastfeeding is everything."

It is necessary to find mothers who are unable to breastfeed regardless of any effort (hypogalactia) at an early stage and support them in preventing lack of self-confidence/low self-esteem caused by perceptions of failure to supply sufficient breast milk and also a destabilized identity as a mother. For this, in relation to physical factors, particularly issues related to mammary glands and hormones associated with breast milk secretion, it is desirable to develop simple and adequate tools that are less invasive to subjects and enable them to identify important issues.

In addition to dealing with the physical, psychological, and societal problems and challenges that cannot be solved simply by encouraging breastfeeding or trying to instill an increased motivation, by providing valid care, including prenatal education/instruction on breastfeeding techniques/support after discharge from the hospital, finding mothers who are unable to breastfeed sufficiently at an early time and developing required care will become future topics of investigation in relation to breastfeeding.

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