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Article

Opinions of Midwives Regarding the Introduction of Breast Ultrasound in Mothers' Breast Care

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A B S T R A C T

Aim: Japanese midwives endorse traditional breastfeeding methods, including supportive techniques such as breast massage for breastfeeding mothers. However, midwives' care alone cannot resolve postpartum breast problems in all mothers. This study clarified midwives' opinions of introducing breast ultrasound as a part of the breast care routine. Methods: The participants were divided into two groups of five and six midwives. Data were collected through a focus group interview. The interview data were analyzed qualitatively. This study used a qualitative narrative analysis. Results: Three reasons for the introduction of ultrasound for breast care were revealed to the midwives. Japanese midwives disagreed with the introduction of breast ultrasound, stating that breast ultrasound was difficult, expensive for the mother, may cause an economic burden, and is not a useful tool for midwives as it was beyond their current scope of service. The midwives agreed that introduction could positively impact the mother's psychological stability by improving midwives' skills and efficiency of care available. The third reason was the need for preparation: the improved breast ultrasound machine and provision of training to improve skills to help operate the machine would help midwives accept this new technology.

Conclusion: Japanese midwives have a strong be lief in their traditional skills. However, they agree about the benefits of introducing breast ultrasound for breast care. Easy-to-operate breast ultrasound machine and training on operating it for the midwives would be essential to increase acceptance among midwives.

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I. INTRODUCTION

Pregnant women often wish to breastfeed after childbirth, but in reality, it is difficult for a mother to raise her baby by breastfeeding alone. Mothers believe that breastfeeding is very good for their children. The reasons for this may be that mothers' breastfeeding 1) enhances the child's immunity, 2) promotes attachment formation between the mother and her child, and 3) reduces abuse rate. However, mothers often have to resort to artificial milk, without fulfilling their wishes to breastfeed. Mothers who breastfeed are more likely to continue breastfeeding despite being provided with breast support (Shiraishi et al., 2020). This support is provided mainly by midwives in Japan; their breast care method involves the use of hands only. The technique is traditional, delicate, polite, and professional (Anderson et al., 2019). The skills of Japanese midwives are established based on experience. By observing and massaging many mothers' breasts, midwives can develop their skills to provide confidence and care to new mothers.

In Japan, there are 1168 facilities run solely by midwives. Mothers receive breastfeeding care from hospital midwives and midwives-only facilities. Midwives spend 1–2 hours at a time providing breastfeeding care to mothers. The midwife will handle the mother's breasts very carefully to ensure that they are in good condition. The midwife observes the condition of the mother's breast, massages it, corrects the baby's breastfeeding posture, and corrects the baby's sucking lips. If necessary, the midwife will be consulted regarding the mother's childcare.

However, even with professional breast care, the mother's breast condition may deteriorate (Martin, 2009). There are various reasons for the deterioration: 1) the child cannot suck well, 2) the mother's mammary glands are clogged, 3) the mother's milk amount is large, and 4) the mother's breast is inflamed. Often, mothers with poor breast conditions may be forced to stop breastfeeding and may subsequently suffer psychological distress, negatively impacting parenting (Crepinsek et al., 2020). As a result, midwives must improve their skills to assist breastfeeding mothers effectively. However, midwives use only subjective indicators when deciding how to care for the mother's breasts (Teshima et al., 2017). Therefore, we propose adding an objective index to the subjective index used by midwives. Midwives in Japan are prohibited from providing diagnostic and medical services provided by medical doctors; however, they can provide temporary first aid (Ministry of Health, Labor and Welfare, 2005). When a midwife identifies an abnormality in a pregnant, intrapartum, or postpartum patient, fetus or newborn infant, she can request medical attention for the patient (Ministry of Health, Labor and Welfare, 2005). Thus, in an emergency, midwives may use abdominal ultrasonography to determine abnormalities as a provisional but objective evaluation. Although midwives use abdominal ultrasound, few make use of breast ultrasound. The hospital has introduced abdominal ultrasound for use under a doctor's instructions. This is because Japan has a medical fee system by which diagnoses by doctors benefit hospitals. Midwives—including those starting a private practice—are not eligible for medical fees as they are a free medical service, even if they use breast ultrasound. There are no legal restrictions on the use of breast ultrasound by midwives, yet very few midwives use it. Therefore, we aimed to gather the opinions of traditional Japanese midwives on the incorporation of breast ultrasound technology in their breast care methods. Understanding the needs of midwives with respect to the introduction of breast ultrasound will help them increase acceptance of an objective observation index using breast ultrasound in addition to using subjective hand methods. Moreover, the analysis

will focus on recommendations for developing an objective index technique using breast ultrasound that will enable early medical intervention.

II. METHODS

1. Participants

Eleven midwives, who specialized in breast massage for breastfeeding mothers, participated in the study. This qualitative analysis was conducted through focus group interviews. As long as the group dynamics are maintained, the number of participants in a focus group interview does not make any difference to the outcomes (Sharon, 1996). When focus group interview is used in exploratory research, one or two groups are sufficient (Sharon, 1996). Therefore, participants in this study were divided into groups of five and six midwives.

2. Recruitment method

We requested assistance from one facility of the Prefectural Midwives Association for research cooperation. The prefecture midwifery association sent a recruitment email to their members inviting midwives to participate in this study, and interested midwives were urged to contact the researchers via email. The researchers then sent the midwives a research cooperation request, survey description, a consent form, and a consent withdrawal form. If the midwife agreed to participate in the study, the consent form was emailed to the researcher. Thereafter, researchers scheduled focus group interview with the midwives. The researchers sent the Zoom URL to the participants via email before the focus group interview. the interviews were held in a private room. On the day of the interview, the researchers and each participant conducted the interview in a private room for confidentiality.

3. Data collection

Semi-structured interviews were conducted using focus group interviews; however, due to the COVID-19 pandemic, the focus group interview could not be conducted in person. The Zoom video conferencing platform (Zoom Video Communications, San Jose, CA, USA) was used, and the focus group interviews were recorded. The researchers explained to the participants how to use Zoom. The Zoom recording function was used for audio and video recording. The duration of each focus group interview was 75 min. The interview dates were August 30, 2021, and August 31, 2021.

4. Interview guide

The researchers confirmed consent with the participants prior to the interview. The researchers did not call the participants by their exact names; instead, they were addressed by “participant A,” “participant B,” etc. The researchers informed the participants of the audio-visual recording before starting. To begin the interview, we asked for age, years of experience as a midwife, and years of experience in breastfeeding support.

Researchers informed participants not to include personally identifiable information. We were also careful not to ask participants anything that could identify them. If the participants mentioned something personally identifiable, it would be called to their attention; however, no such need arose.

The interview guide consisted of two questions. They were related to mastitis and ultrasound. Mastitis is an inflammation of breast tissue, mostly occurring in breastfeeding women, which may be associated with infection and causes significant physical discomfort. The first was, “Have you ever used breast ultrasound to prevent mastitis in breastfeeding mothers?”, while the second was, “What is your opinion on the use of breast ultrasound to prevent mastitis in breastfeeding mothers?”

5. Method of Analysis

We created verbatim records of the focus group interviews and coded them. The record was analyzed inductively and carefully to preserve the accuracy of meaning. The aggregation process was repeated inductively. Similar codes were collected and categorized. Furthermore, similar categories were assembled and divided into core categories. The process of inductive aggregation was conducted four times until further similar contents were not observed. Two midwife researchers performed the analysis.

6. Ethical considerations

This study was conducted in accordance with the Declaration of Helsinki. Participants were given the research content in writing and consented to the research content. The research data has been anonymized. We explained to the participants that their participation in this study was voluntary, and that non-participation would not be a professional disadvantage. However, we informed the participants that withdrawal of consent for the focus group interviews should be before initiating focus group interviews and not after completing the focus group interviews. Participants did not withdraw their consent to the study. The focus group interview data were stored in private locations by researchers and access is strictly controlled. The focus group interview would not include personal information, and the data collected would be stored strictly for 10 years and then destroyed. This study was approved by the Medical Ethics Committee of the Faculty of Medicine, University of Tsukuba (No. 1637), and the Dokkyo Medical University Nursing Research Ethics Committee (No. 03009).

III. RESULTS

1. Participant attributes

There were six midwives in the first group and five in the second group. The ages of the participants were as follows: one was in their 30s, three in their 40s, five in their 50s, and one in their 70s. The participants had practical experience as midwives: four had experience from 10 to 20 years, three from 20 to 30 years, two from 30 to 40 years, and two from 40 to 45 years. The participants' experience with breast care was as follows: three had experience of 5–10 years, two of 10–20 years, three of 20–30 years, and three of 30–45 years. The participating midwives had extensive experience as midwives and in providing breast care.

2. Reasons Presented to the Midwives for Introduction of Breast Ultrasound

Three reasons for using ultrasound for the prevention of mastitis were given to the midwives. The first reason was a non-positive reason: the potential of losing the ability to subjectively judge the condition of the breast with only the hands and an increased burden on mothers. The second reason was positive: the potential increase in the mother's psychological stability through the improvement of the midwife's skills and efficiency of care. The third reason was the need for preparation: the training of midwives to conduct breast ultrasounds and improve their skills. These categories are indicated in square brackets, and the narrative is indicated by italicized text in quotation marks.

2.1 Negative reasons: [The potential loss of the midwife's ability to subjectively examine the breast and an increased burden on mothers]

Japanese midwives disagreed with the introduction of breast ultrasound, stating that breast ultrasound was difficult, expensive, and not a useful tool for midwives. They further added that abdominal ultrasonography was rarely used during regular health examinations of pregnant women. First, they said, *"Obstetricians do not seem to use breast ultrasounds for mothers' breasts. If doctors do not use breast ultrasound, I doubt that breast ultrasound is useful."* As obstetricians often perform abdominal ultrasonography scans during the regular health examinations of

pregnant women, the participant said, *"I feel that since abdominal ultrasound is difficult, breast ultrasound may also be difficult. I have a strong feeling that I will not be good at breast ultrasonography."* The practicing midwives said, *"I cannot buy a breast ultrasound machine because it is very expensive. Since few mothers have breast problems, I do not think it will be necessary to have a breast ultrasound machine*."

Second, a midwife claimed she might lose her hand skills and the mental support system she cultivates. Midwives were worried that their traditional midwifery role would disappear. The midwife explained, *"I have been able to improve breastfeeding from mothers' breasts with a hand massage without the use of breast ultrasound. Therefore, I do not want to use breast ultrasound*." In addition, the midwife explained that ultrasonography should be performed in a hospital by a laboratory technician and that the role of the midwives was focused on providing hand skills and mental support for the mothers.

The third negative reason was that midwives were worried that the situation would change significantly; the relationship between midwives and doctors would be disrupted, mothers' costs would be higher, and mothers may be dissatisfied with the midwifery breast care provided. Specifically, the midwife was concerned: *"Mothers with lumps in their breasts experience pain just by touching their breasts. I do not want to use breast ultrasonography in mothers who are experiencing pain. In addition, when a midwife uses breast ultrasound, the mother has to pay us for the breast ultrasound, and it will increase the financial burden on the mother*." The midwives, however, agreed that breast ultrasonography could be an additional tool for assessment. However, they said, *"Midwives will provide breast care for the same amount of time as before, even if they introduce breast ultrasound*." Regarding the role of the midwives and doctors, *"breast ultrasound is the job of a breast surgery doctor. It is adequate to see a doctor and then return to a midwife as before*."

2.2 Positive reasons: [The potential increase in the mothers' psychological stability through improved midwife skills and efficiency of care.]

This was explained as follows: the introduction of breast ultrasound does not reduce the work of midwives. However, the effects of care may increase. A midwife discussed four possible key effects. The first was *"breast ultrasound can be used to find the cause of the condition of the breast ailment and therefore make the breast massage more efficient*." The second was *"breast ultrasound supports the midwife's palpation care and improves the effectiveness of the care*." Third, *"the use of breast ultrasound can enable midwives to assess the mastitis at an early stage and consult a doctor accordingly, thereby improving the mother's mastitis sooner*." Fourth, *"I feel that midwives can improve their care by being able to perform both the breast ultrasound and their midwifery hand skills*."

In addition, a positive opinion was expressed regarding herself as a midwife. It was possible that the size of a lump in the breast could be determined by the midwife with only the sensation of her hand. However, the midwife would be able to objectively determine the size of the lump in the breast with the use of breast ultrasound. This raised the motivation of midwives because it would improve their skills as midwives. The midwives explained, *"Our use of the breast ultrasound will improve our procedures*." The midwives hoped: *"I want breast ultrasound as an auxiliary tool and as a skill to understand the condition of the breast*." The expectations of midwives were: *"If using breast ultrasound can help midwives make our own palpation decisions and questions, it will be rewarding*." There were two suggestions. The first was, *"The process of learning how to use the breast ultrasound (new technology), using it well, and being able to explain it to the mother will be burdensome and difficult. Therefore, it would be beneficial to have a professional midwife who can use breast ultrasound*." The second suggestion was, *"It is not necessary to use breast ultrasound for all the mothers. However, I want to use it not only when I*

assess the condition of the breast to be poor, but also when I assess the condition of the breast to be without any problems.

For explaining positive reasons to a mother, using breast ultrasound can become a communication tool between the mothers and midwives; the midwife maintains the mother's satisfaction by objectively explaining the breast's condition to the mother. The midwives said, *"I can explain more specifically the assessment obtained with breast ultrasound than an assessment made using my hands. In doing so, the midwife can strengthen the relationship of trust with the mother*." The midwife also talked about the mother's thoughts on breast ultrasound. She said, *"For mothers who were accustomed to an abdominal ultrasound, their acceptance of breast ultrasonography would be good. These mothers would be better able to understand and communicate with midwives in their explanation of their breast ultrasound decisions*."

2.3 Need for preparation: [Training midwives to conduct breast ultrasounds and improve their skills.]

Midwives commented that two conditions were necessary for the introduction of breast ultrasound. The first was an opinion on the breast ultrasound device: breast ultrasound devices should be inexpensive, small, and produce clear images easily. The midwives explained: "*If the breast ultrasound device is inexpensive, it will be easier for midwives to acquire*." The midwives also said, *"If it's not a small portable breast ultrasound, we can't use it at the destination*." The midwives also had a view on the ideal position: *"It would be interesting to be able to see the inside of the breast and each duct using 3D breast ultrasound*."

The second step was establishing a breast ultrasound training method: Midwives can confidently perform breast ultrasound using text with easy-to-understand images and realistic step-by-step training to learn the detailed procedure. The midwives talked about their expectations: *"If I can use breast ultrasound, I want to be able to assess the image*." Midwives expressed hope that training would help analyze images: *"If real training can be provided to obtain a good picture, midwives will be confident in using a breast ultrasound*." In addition, the midwife's expectations were *"If a textbook that shows the progress of changes in the breast during breastfeeding and a step-by-step workshop for learning the procedure is provided, midwives will be able to perform breast ultrasonography*."

Table 1. Categorization of opinions on the introduction of breast ultrasound by midwives

Reason	Category	Subcategory
Negative reasons	[The potential loss of the midwife's ability to subjectively examine the breast and an increased burden on mothers.]	Breast ultrasound is difficult, expensive, and not useful for midwives to do.
		Midwives may lose the midwifery skills (hand) and mental support that they cultivate for the mothers.
		Midwives may not be able to work with doctors, resulting in increased costs for mothers and dissatisfaction.
Positive reasons	[The potential increase in the mothers' psychological stability through improved midwife skills and care efficiency.]	Work may not lessen, but care may be more effective by resolving the cause.
		Midwives will improve their skills and motivation.
		It is a communication tool and will help give objective explanations to mothers.
Need for preparation	[Training midwives to conduct breast ultrasounds and improve their skills.]	Midwives want to use it if it is cheap, small, and provides clean image.
		Midwives will be confident using illustrated textbooks and step-by-step training.

IV. DISCUSSION

Japanese midwives strongly believe that their skills and care can reduce mastitis in breastfeeding mothers. They carry out care based on a lot of experience and their care has helped many mothers improve their breast condition and continue breastfeeding. Therefore, they were concerned about relying on breast ultrasonography to determine the condition of the breastfeeding mothers' breasts. This was because the traditional technique used by midwives has been in decline. Japanese midwives provide breast care and save many mothers (Iida et al., 2021). It is necessary to continue the traditional techniques used by Japanese midwives. In Japan, midwives play a central role in breast care. Midwives with great skill in breast massage need to pass on their skills to the next generation. We believe that the education that we pass on to the next generation is very important.

However, midwifery breast care may not improve breast condition. Consequently, mastitis in the mother's breast may become more severe, and the mother may be more distressed and burdened by breast pain. Therefore, in Japan, guidelines were developed to prevent the aggravation of mastitis (Japan Academy of Midwifery, 2020). However, the mastitis guidelines only indicate "fever" and "breast redness" as indicators of an objective assessment of mastitis (Japan Academy of Midwifery, 2020). The guidelines also indicate when to consult your doctor; however, the timing of consultation with a doctor is not clear and the decision is left to the midwife. Participants in this study did not agree on the timing of consultation with doctors, indicating that midwives subjectively assess mastitis.

The participants in this study have provided many positive reasons for introducing breast ultrasonography as a method of postpartum breast care. In addition to the subjective assessment of midwives' traditional procedures, breast ultrasound was useful as an ancillary support method. Breast surgeons use breast ultrasound when diagnosing mastitis. However, legally, Japanese midwives are not allowed to make a diagnosis (Ministry of Health, Labor and Welfare, 2005). The process by which midwives refer the mothers to doctors for diagnoses is well established: the midwife refers the mother to a doctor, who will then make a diagnosis after the midwife has determined the possibility of mastitis. Therefore, we believe that the midwife should help assess mastitis and decide the need for a referral to a doctor or to continue with traditional breast care. The use of breast ultrasound as an auxiliary tool is effective for midwives and helps reduce the burden and anxiety of the mother. Visual assessment based on breast ultrasound images may be more convincing for the mother. The mother cannot objectively know that her breasts are recovering better. Through ultrasound images and explanations by a midwife, the mother can understand the condition of her breasts objectively as well as subjectively. In addition, ultrasound may be used to objectively evaluate whether a child can suckle effectively while breastfeeding (Douglas & Geddes, 2018). Therefore, the breast ultrasound may be used as an auxiliary tool in addition to the traditional midwifery procedure.

We recommend developing an easy-to-operate breast ultrasound system to ease the introduction of breast ultrasound into midwifery breast care. Participants in this study spoke of difficulty in using ultrasound, incomprehensibility of the machine function, anxiety about judging the images, and lack of knowledge, among other concerns. Midwives need to have sufficient knowledge, skills, and self-confidence in order to be able to use breast ultrasound successfully. However, we believe that improving only the skills and knowledge of midwives is insufficient. We need software that makes breast ultrasound equipment easy to use, makes accurate judgments, and is accessible even for midwives who are inexperienced in sonication techniques. In terms of skill set, midwives need clear breast ultrasound images and the ability to determine normal and abnormal images accurately. In terms of hardware, midwives would require a small, portable ultrasound device. Participants in this study wanted easy-to-carry breast ultrasound equipment.

Many Japanese midwives are entrepreneurs and visit a mother's home to provide care. Thus, midwives need easy-to-carry equipment to make breast ultrasound easy to use and for ease of travelling or for easier portability.

We recommend the development of a course to train midwives in the use of breast ultrasound. The midwives were not skilled in the use of ultrasound. For midwives to use breast ultrasound daily and improve breast care, their skill-based weaknesses must be reduced. Midwives must be able to hold the probe, apply it to the breast, project the image, and interpret the image. Midwives need to master many skills before they can use breast ultrasound. It is difficult, time consuming, and burdensome for midwives to learn on their own to become proficient. Therefore, we recommend establishing a training method that enables easy practice with an opportunity for step-by-step learning so that they can learn the techniques used in breast ultrasonography and skills of analyzing the images.

Finally, the prevalence of breast cancer is increasing in Japan (Japanese Breast Cancer Society, 2012), and midwives are not allowed to diagnose using breast ultrasonography. Midwives help mothers identify breast lumps by feeling their breasts and referring them to a doctor. Midwives are rarely able to make decisions using objective indicators.

However, the ability of midwives to accurately use breast ultrasound to determine the possibility of an abnormal breast condition may lead to an appropriate decision to consult a doctor. In other countries, midwives have attempted to use breast ultrasonography to determine breast cancer, leading to a consultation with a doctor (Kardinah et al., 2014). Therefore, the ability of midwives to use breast ultrasonography will help maintain many women's health. To improve the breast massage technique of Japanese midwives, it is necessary to consider incorporating the use of breast ultrasound.

Study limitations

Participants in this study ran a maternity home or visited a mother's home to take care of them. This study did not include midwives working in hospitals. Many Japanese midwives work in hospitals, and since the participants in this study are midwives working in one area, this study does not reflect the opinion of midwives across Japan. The introduction of breast ultrasound will likely begin at a hospital with a doctor, not at a midwifery home run solely by midwives. This is because breast ultrasound is expensive, and hospitals are the only facilities that can afford them.

Areas for future research

It is necessary to interview practicing midwives as well as midwives and obstetricians working in hospitals to get their opinions about breast ultrasonography in breast care. In the future, broadening the target audience and clarifying the need for breast ultrasound will be necessary. Second, there is a need to develop a breast ultrasound machine that is easier to use. Third, the number of training sessions for breast ultrasonography will need to be increased sufficiently.

V. CONCLUSION

Japanese midwives strongly believe in their traditional breast care methods. However, they also seek to objectively grasp the medical condition of the breast whilst cherishing tradition. Moreover, although midwives wish to use breast ultrasound, they are not confident in the technique. Therefore, breast ultrasound should be introduced as a tool to assist midwives' procedures. In addition, the introduction of breast ultrasound would require improvements in the structure and performance of breast ultrasound equipment. The midwives will need training sessions to help them use these machines effectively.

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