



Menstrual Cup Use in Japanese Women: Subjective Evaluations and Changes in Menstrual Symptoms

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ABSTRACT

Background: Menstrual cups are a safe and economical alternative to sanitary pads or tampons that also hold equal or smaller quantities of menstrual blood. However, menstrual cups are seldom used by Japanese women. Some Japanese women have recently described on their blogs their experiences of using imported menstrual cups.

Purpose: The purpose of this study is clarify the changes in menstrual symptoms associated with the use of menstrual cups and to explore the availability of menstrual cups among Japanese women.

Methods: A mixed method design of both qualitative and quantitative approaches was used. Participants were 22 healthy Japanese midwives with no organic diseases of the uterus or experience of using menstrual cups. The Menstrual Distress Questionnaire (MDQ) was administered before and after intervention with use of menstrual cups, and the presence of any changes in the MDQ score was investigated. Participants used menstrual cups during three menstrual cycles, and recorded the ease of use, degree of comfort, and the presence or absence of pain and problems.

Results: The scores of the MDQ completed by 22 Japanese midwives were compared and no significant difference between the two was found, suggesting that the use of a menstrual cup would not have a deteriorating effect on menstrual symptoms. Sixty percent of the feedback from participants who used menstrual cups for the first time was negative, such as Discomfort when using menstrual cup and worry also discomfort regarding hygienic handing of cup. However, over 70% mentioned the physical advantages of menstrual cups over conventional sanitary products such as Reduction in menstruation-related discomfort and Ease of dealing with menstruation.

Conclusion: Our study findings suggested that reducing psychological hesitation and decreasing negative impressions, such as anxiety about using it for the first time, are important to promote wider use of menstrual cups by Japanese women.

Keywords: *menstrual cup; menstrual distress questionnaire; availability; Japanese women*

BACKGROUND

In June 2019 (VanEijk et al., 2019) affiliated with the Liverpool School of Tropical Medicine in the UK, published the article “Menstrual cup use, leakage, acceptability, safety and availability: a systematic review and meta-analysis” in *The Lancet Public Health*. According to this systematic review and meta-analysis of 43 studies (N = 3,319), menstrual cups are a safe and economic alternative to sanitary pads or tampons that also hold equal or smaller quantities of menstrual blood.

Today, menstrual cups are manufactured and sold in Western countries, such as Canada, the US, UK, and Germany, and some interventional studies have reported on their use (Carnethon et al., 2012; Stewart et al., 2010). (Shwetha & Amritha, 2020) compared satisfaction, discomfort, vaginal infections, costs of use, and quantity of waste in a randomized controlled trial (RCT) of tampon and menstrual cup users and reported that menstrual cups are feasible alternatives to tampons and effectively reduce costs and waste, providing an environmentally friendly alternative as well. (Beksinska et al., 2015) conducted an RCT on South African women and reported that the group of women who used the menstrual cup provided considerably better evaluations of the sanitary product in terms of comfort, quality, collection of menstrual blood, and external appearance than the group of women who used menstrual pads and tampons (Tabuchi Y, Yoshidome A, Ban N, 2014).

Menstrual cups known in Western countries are rarely used by Japanese women. A reason for this could be associated with the fact that menstrual cups are not being actively manufactured and sold in Japan (UNICEF, 2019). Simultaneously, a small number of Japanese women have written about their experience using imported menstrual cups on blogs, and the media are starting to cover topics pertaining to them as well. According to a survey conducted in 2013, 70%–80% of Japanese women were using disposable sanitary pads, whereas 20%–30% were using tampons and reusable pads (Netresearch DIMSDRIVE, 2021). The earliest studies in other countries on the development and research of menstrual cups date back to approximately 30 years ago, but studies on sanitary products in Japan till date have focused on topics such as the physical and psychological effects of wearing sanitary pads (Kaimura & Ueda, 2015; Mimura et al., 2011) and effects of reusable sanitary pad use on female students’ indefinite complaints and no interventional studies using menstrual cups exist.

This study thus aimed to survey and elucidate how Japanese women feel about the use of menstrual cups and to compare the use of menstrual cups with that of conventional sanitary products (Kaimura & Kusaga, 2008).

OBJECTIVE

The purpose of this study is to clarify the changes in menstrual symptoms associated with the use of menstrual cups and to explore the availability of menstrual cups among Japanese women.

METHODS

Study design

This study adopted a mixed methods with an explanatory sequential design to obtain participant feedback on the interventions of menstrual cup use. Menstrual Distress Questionnaire (MDQ) scores were collected and analyzed as quantitative data. Moreover, questionnaire description data after the use of menstrual cups were collected and analyzed as qualitative data.

Participants

Participants were 22 healthy Japanese midwives without organic disease of the uterus and no previous experience of using a menstrual cup, who were recruited by network sampling method. Questions were asked to all 22 participants for collecting mixed data.

Collected data

1. Menstrual symptoms assessed by the MDQ

The Japanese version of the MDQ was administered to participants before and after menstrual cup use to evaluate their menstrual symptoms to find changes in total MDQ scores while using conventional sanitary products and while using a menstrual cup. Among the 47 items in 8 subscales developed by (Moos, 1986), 2 subscales that are infrequent complaints among Japanese women, Mood upliftment and Control were excluded. Total scores for the 35 items in the remaining 6 subscales, Pain, Concentration, Behavioral change, Autonomic reactions, Water retention, and Negative feelings of the MDQ were used for analysis (Goto & Okuda, 2005; Kaimura & Kusaga, 2008). There are two forms of the MDQ: the “Retrospective” Form A, which is used by recalling the estrous cycle, and the “Today” Form T, which is used for answering questions about the conditions on the day on which the questionnaire is being used. This study used the MDQ Form T that had to be completed on the 2nd or 3rd day of menstruation. Of four menstrual cycles in the survey period, participants used conventional sanitary products that they were using for one cycle, and menstrual cups for the remaining three (Figure 1). MDQ Form T completed in the week when conventional sanitary products were used and in the third cycle of using a menstrual cup were evaluated on a four-level scale of none (0 points) to intense (3 points). Data collection period was from July 2016 to February 2017. Tabulation of data and nonparametric tests for statistical analyses were performed with SPSS ver. 25.

Figure 1 Menstrual cup used in this research



2. Original questionnaire on menstrual cup use

After using the menstrual cup for three menstrual cycles, the subjects were asked to evaluate on a 5-level scale between “very possible” and “I do not know” on ① whether they might continue using the cup, and ② whether Japanese women could use the cup. Furthermore, they were asked to provide free responses on ③ impressions after using a menstrual cup, ④ differences with conventional sanitary products, and ⑤ what might be needed to promote wider use of menstrual cups among Japanese women. Common

concepts in free response answers were coded, classified for each group of common concepts, and then categorized.

To increase certainty, study participants member-checked the results of the qualitative data analysis. The dependability of the data analysis process was confirmed through careful examination by two researchers who were experienced in qualitative studies. This was supervised by the researchers who were proficient in content analysis.

Ethical considerations

Study participants were explained in writing and verbally about the nature of the study by the researcher. Further, they were explained that they had free will in participation, that their consent could be withdrawn at any time, and that their privacy and anonymity would be preserved. All participants gave written informed consent. This study was approved by the ethics review board of Shiga Prefecture University (approval number -500).

RESULTS

Participants

Participants comprised 10 parous (45.5%) and 12 nulliparous (54.5%) women (mean age, 32.9 ± 7.4 years). Twenty participants had their first period at 10–14 years of age (90.9%), and two when they were 15 years or older (10.1%). Fifteen of the participants had regular menstrual cycles (68.2%), six had irregular cycles (27.3%), and one had unknown regularity because their menstrual cycles had just started after giving birth (4.5%). The duration of menstruation was between 3 and 7 days in all participants.

Types of sanitary products routinely used by participants were as follows: disposable sanitary pads only, $n = 12$ (54.5%); both disposable sanitary pads and tampons, $n = 8$ (36.4%); and both disposable and reusable sanitary pads, $n = 2$ (9.1%).

Approximately 60% of participants experienced discomfort, including chafing, unpleasant odor, dampness, and leakage, with their regular sanitary products.

Regarding their awareness of menstrual cups, 12 participants (54.5%) had never heard of them, 5 (22.7%) had heard of the term only, and 5 (22.7%) had some familiarity with them. There was no one who answered that knew what it was like.

Of the 22 participants, 5 gave up the use of the menstrual cup before the end of the study period. Among these five, one stopped because of amenorrhea due to pregnancy, and the others stopped owing to the difficulty in inserting or discomfort of using a menstrual cup.

Regarding their awareness of menstrual cups, 12 participants (57%) had never heard of them, 4 (19%) had heard the term only, and 5 (24%) had some familiarity with them.

Changes in menstrual symptoms

Table 1 presents the mean and standard deviation (SD) of various MDQ item scores while using conventional sanitary products and while using a menstrual cup.

The mean total MDQ scores during the periods of the 17 participants were 16.8 ± 13.9 points while using the conventional sanitary product and 22.1 ± 20.1 points while using the menstrual cup. The Wilcoxon-signed rank test analysis revealed that there was no significant difference between the two groups.

Table 1. Menstrual Distress Questionnaire Scores by Item (Mean \pm SD) (n = 17)

Item	Conventional menstrual product use		Menstrual cup use	
	Mean	SD	Mean	SD
Pain				
Shoulder and neck stiffness	1.18	1.24	1.06	1.20
Headache	.53	.87	.88	1.11
Cramps	1.47	1.07	1.76	1.20
Lower backache	.65	.79	.88	1.32
Fatigue	1.29	1.16	1.24	1.20
General aches and pains	.18	.53	.24	.66
Water Retention				
Weight gain	.65	.93	.88	1.05
Skin disorders	.76	1.03	1.00	1.12
Painful breasts	.35	.70	.47	.72
Swelling (e.g., abdomen, breasts, feet)	.65	.79	.88	1.05
Behavior Change				
Decline in school or work performance	.76	.90	.82	1.01
Taking naps	1.00	1.17	1.24	1.25
Staying at home	.59	.94	.59	.94
Avoiding social activities	.29	.59	.65	1.06
Decreased efficiency of studying or working	.53	.80	.94	1.20
Negative Effect				
Sadness	.06	.24	.35	.86
Loneliness	.29	.69	.53	.94
Anxiety	.29	.77	.47	.87
Restlessness	.35	.70	.35	.61
Anger	.71	.92	.65	1.00
Mood swings	.35	.70	.41	.71
Depression	.59	.94	.76	1.09
Irritability	.12	.49	.24	.56
Impaired Concentration				
Insomnia	.18	.53	.53	.80
Forgetfulness	.18	.53	.41	.80
Confusion	.59	.80	.65	.93
Decline in judgment	.18	.39	.41	.87
Difficulty concentrating	.88	.93	.76	1.09
Distractible	.41	.71	.59	1.06
Accidents such as cutting fingers or breaking dishes	.06	.24	.35	.86
Lowered motor coordination	.18	.53	.12	.33
Autonomic reaction				
Dizziness	.18	.39	.29	.77
Cold sweats	.12	.49	.06	.24
Nausea	.18	.39	.47	.94
Hot flashes	.06	.24	.12	.49
35 Items in total	16.82	13.92	22.06	20.08

Possibility of using menstrual cups

1. Individual possibility of continuing the use of a menstrual cup

With regard to continued use of the menstrual cup, a total of 10 participants (45.0%) definitely wanted to continue use of a menstrual cup, 1 (5.0%) wanted to continue use if possible, 10 (45.0%) preferred not to continue use, and 1 (5.0%) was undecided. The

participant who became pregnant during the study answered that “I do not know, because I might get used to it if I used it for a bit longer.”

2. Possibility of menstrual cup use among Japanese women

With regard to the possibilities for menstrual cup use among Japanese women, 6 participants (27.0%) said there was a sufficient possibility, 11 (50.0%) said there was a possibility, and 5 (23.0%) said the possibility was low.

3. Impressions after menstrual cup use

All 22 study participants wrote about their opinions on the cup after using it. Examples of data written in the free response spaces are provided in italics below.

“There was no discomfort once I got used to it, and I was able to forget that I was having my period. I was very anxious about dirtying my hands or clothes to empty menstrual blood. I was worried about whether the bathroom had a proper sink for washing hands. It took some time until I got the hang of pushing out the cup to change it easily. The dampness of sanitary pads was always unpleasant for me, so I was glad that I could shorten sanitary pad wear time. It was not as if the cup had no odor whatsoever, so I thought a lot about how to store it” (ID04, a 29-year-old nulliparous participant).

“The cup kept opening while I tried to insert it, so it was difficult until I got the hang of it. The first time I used it during my period, my hands became dirty and it was difficult to insert the cup. I think it would be best to practice before an actual period for smoother insertion. I felt that it was difficult to tell whether it was inserted in the correct position” (ID16, a 32-year-old nulliparous participant).

“I was very anxious about it at first. I was concerned whether it was inserted correctly, and I also had discomfort. On my second or third try, I started to get used to it, so much that I forgot that I had inserted a cup at all. At other times, it leaked suddenly, which made me a bit panicked” (ID22, a 46-year-old parous participant).

Table 2 shows the results of descriptive content analysis regarding the post-use impressions of the menstrual cup. The obtained descriptive data was classified into 74 codes, 16 subcategories, and 6 categories, and finally could be classified into positive feedback and negative feedback. Below, the category name is indicated by [] and the sub-category name is indicated by [].

The following were extracted as positive feedback. First, participants answered about the [comfort when using menstrual cup]; e.g., that the menstrual cup was [so comfortable it is possible to almost forget about menstruation] and that they experienced [no more of the discomfort felt when using disposable pads]. As [merits of using menstrual cup], they answered that it was [economical and very convenient during daily life] and that they developed [increased interest in menstruation]. Finally, they achieved [ease and methods of insertion and removal learned through repeated use], finding that the menstrual cup was [easier and more comfortable to wear than expected] and they [learned methods of insertion and removal and getting accustomed to the cup through repeated use].

In contrast, the following were extracted as negative feedback. For example, they experienced [discomfort when using menstrual cup]; i.e., [pain when wearing the cup], [unpleasant sensation when inserting the cup], and [difficulty inserting and removing the cup] and [Worry and discomfort regarding hygienic handling of cup]; i.e., [Resistance to

getting hands messy when handling the cup], [worry regarding hygiene in the toilet], [resistance to reinserting dirty cup] and [worry regarding backflow of menstrual blood and storage of the cup], and finally, [mental burden associated with menstrual cup use] such as [nervousness and impatience at initial use] and [resistance to inserting cup into vagina and worry regarding correct insertion and removal].

Altogether, 27 codes on positive feedback and 47 codes on negative feedback were obtained from the 74 codes.

Table 2. Post-use impressions of the menstrual cup (Number of codes)

Positive feedback	Comfort when using the menstrual cup	No more of the discomfort felt when using disposable pads (5)
		So comfortable it is possible to almost forget about menstruation (4)
	Merits of using the menstrual cup	Economical and very convenient in daily life (6)
		Increased interest in menstruation (2)
	Ease and methods of insertion and removal learned through repeated use	Learning methods of insertion and removal and getting accustomed to the cup through repeated use (7)
		Easier and more comfortable to wear than expected (3)
Negative feedback	Discomfort when using the menstrual cup	Pain when inserting or removing the cup (8)
		Difficulty inserting and removing the cup (7)
		Unpleasant sensation when inserting the cup (5)
		Time and effort required to insert and then empty and replace the cup (3)
	Worry and discomfort regarding hygienic handling of the cup	Resistance to getting hands messy when handling the cup (5)
		Worry regarding hygiene in the toilet (2)
		Resistance to reinserting the dirty cup (2)
	Mental resistance to use of menstrual cup	Worry regarding backflow of menstrual blood and storage of the cup (2)
		Resistance to inserting cup into the vagina and worry regarding correct insertion and removal (8)
		Nervousness and impatience at initial use (5)

4. Differences with conventional sanitary products

Nineteen participants provided opinions on the differences between the menstrual cup and menstrual products they normally used. Examples of data written in the free response spaces are provided in italics below.

“Using a menstrual cup reduced how often I worry about leakage overnight considerably. The unpleasant sensations of clots oozing down the vagina or menstrual blood dripping between the buttocks disappeared. Dampness in the genital areas is eliminated, so I no longer have rashes. I used to feel sick from the odor of moisture, so I’m glad that’s gone. I had some lower abdominal pain when I pushed in the bathroom to defecate, perhaps it was the compression of the cup against the rectum” (ID15, a 28-year-old nulliparous participant, normally using disposable pads and tampons).

“I usually use reusable pads. The cup was much easier to use because it takes almost no work to wash it. It leaked a little bit on some days, so I used it with a thin reusable panty liner. By leakage, I mean just a faint stain. Once inserted, it was very comfortable and easy, so I just kept it in for the whole day when the flow became lighter. I sometimes get a rash or feel cold with disposable pads, so it was very comfortable when that was eliminated” (ID12, a 42-year-old parous participant, normally using disposable and reusable pads).

“I thought it was very convenient for heavy flow on day 2 because I was relieved from worrying about changing my pad or leaks. The odor of menstrual blood was unnoticeable. However, the discomfort of menstrual cups persisted, so sometimes I found it difficult to wear at work. Sometimes, symptoms I have with my period such as headache and lower back pain worsened” (ID8, a 32-year-old parous participant, normally using disposable pads only).

“I was reluctant to go to the bathroom sometimes because I did not want to experience the pain. I had a leak of menstrual blood at least once per cycle so I generally used it with a disposable pad, so it did not help me with the dampness either” (ID14, a 29-year-old nulliparous participant, normally using disposable pads and tampons). Table 3 shows the results of descriptive content analysis regarding the differences between using a menstrual cup and conventional sanitary products. The obtained descriptive data were classified into 55 codes, 13 subcategories, and 5 categories, and it could finally be classified into the advantages and disadvantages associated with the use of menstrual cups.

Table 3. Differences between using a menstrual cup and conventional sanitary products

Advantages of using menstrual cup	Reduction in menstruation-related discomfort	No more worries about leakage (8)
		No more dampness, itchiness, or chills (7)
		Comfortable menstrual period with no unpleasant sensations caused by wearing the cup (5)
		No more unpleasant odors from menstrual blood (4)
		No discomfort from feeling of menstrual blood flow (3)
	Ease of dealing with menstruation	Reduced frequency of changing products in the toilet (7)
		Less effort required to wash soiled underwear and reusable sanitary pads (3)
	Others	Increased interest in own body during menstruation (3)
		Increased convenience during daily life (3)
Disadvantages of using the menstrual cup	Discomfort when using the menstrual cup	Discomfort due to pain while wearing the cup, messy hands, and exacerbated menstrual cramping (5)
		Pressure and unpleasant sensation during bowel movements (2)
	Greater difficulty dealing with menstruation	Comparative ease of disposable pads considering the time required to empty and reinsert or replace the cup (3)
		Leaking requiring the use of disposable pads as a backup (2)

The following were extracted as advantages of using the menstrual cup. Participants noticed a [reduction in menstruation-related discomfort] by experiencing [no more dampness, itchiness, or chills], [no more worries about leakage], [comfortable menstrual period with no unpleasant sensations caused by wearing the cup], [no more unpleasant odors from menstrual blood], and [no discomfort from feeling of menstrual blood flow]. They also commented on the [ease of dealing with menstruation] with the menstrual cup, such as [reduced frequency of changing products in the toilet] and [less effort required to wash soiled underwear and reusable sanitary pads]. As for [other], participants had [increased interest in own body during menstruation] and were pleased by [increased convenience during daily life].

As for the disadvantages of using the menstrual cup, participants complained of [Discomfort when using menstrual cup] such as [discomfort due to pain while wearing the cup or messy hands], [exacerbated menstrual cramping], and [pressure and unpleasant

sensation during bowel movement]. They also experienced [difficulty dealing with menstruation] with the menstrual cup when they thought of the [comparative ease of disposable pads considering the time required to empty and reinsert or replace the cup] or had [leaks requiring the use of disposable pads as a backup].

Of the 55 codes, 43 were on the positive changes and 11 were on the negative changes after using a menstrual cup.

5. Conditions required for promoting wider use of menstrual cups by Japanese women

Eighteen of the study participants wrote down their opinions on the necessary conditions required for promoting wider use of menstrual cups among Japanese women. Examples of data written in the free response spaces are provided in italics below.

“I believe it is important to learn about the structures of the body. It requires touching your vagina pretty intimately, so I thought it might be harder for women in the general population. But I believe it would be a good thing to educate people even if they have never delivered a baby before. Many Japanese people expect and practice rigorous hygiene, and some might have concerns about needing to disinfect or limitations on for how many consecutive hours they would feel comfortable wearing the cup. It would be best to reach a consensus. Disposable pads have their advantages, too, so it would be best to promote it as an alternative option. A proper hand-washing sink for all bathrooms!”(ID04, a 29-year-old nulliparous participant).

“With regards to the size issue, I believe it would become easier to use if they worked on some product improvement. When I was discussing this with colleagues, many mentioned that they were reluctant to try it because they felt the cup was unsanitary. Some improvements to enable continuous, sanitary use would be helpful.” (ID02, a 24-year-old nulliparous participant).

“Data to back up the safety of the menstrual cup would be more reassuring because while I was using it, I was worried about whether it was really safe to keep it in for long periods” (ID10, a 34-year-old parous participant).

“I believe it is feasible, but I also believe it is a challenge to help people in the general population to learn how to insert the menstrual cup without difficulty. Even a professional like me, who knows the area very well because I have experience giving pelvic examinations, found it difficult to insert sometimes. I believe many women without such experience will find it uncomfortable just to touch the vagina. However, I believe they will be more than able to use it once they learn how and become confident using a menstrual cup” (ID01, a 29-year-old parous participant).

“People first need to be informed about the existence of menstrual cups. People might become interested if they are available in stores” (ID19, a 23-year-old nulliparous participant).

Table 4 shows the results of descriptive content analysis regarding requirements for the popularization of menstrual cup use among Japanese women.

Table 4. Requirements for the popularization of menstrual cups among Japanese women

Menstruation education initiatives for improving women's health	Provision of information regarding the correct way to handle and use menstrual cups (8)
	Education to promote and popularize menstrual cups (7)
	Appropriate guidance regarding how to wear menstrual cups (6)
	Education to increase understanding of the structure of the female organs (4)
Menstrual cup research and development, fabrication, popularization, and sales within Japan	Compilation of research data regarding the safety of menstrual cup use (4)
	Search for easy methods of insertion and removal (4)
	Manufacture of menstrual cups in Japan for the domestic market (4)
	Popularization and sale at pharmacies and obstetrics and gynecology clinics (3)
Product modification to adapt cup size for Japanese women (2)	
Hygienic toilet environment	Improvement of hand-washing facilities in toilets (4)

The descriptive data obtained in the study were classified into 46 codes, 10 subcategories, and three categories. [Menstruation education initiatives for improving women's health] consisted of [Provision of information regarding the correct way to handle and use menstrual cups], which had the highest number of codes, as well as [education to promote and popularize menstrual cups], [appropriate guidance regarding how to wear menstrual cups], and [education to improve understanding of the structure of the female organs]. [Menstrual cup research and development, fabrication, popularization, and sales within Japan] comprising [accumulation of research data regarding the safety of menstrual cup use], [search for easy methods of insertion and removal], [manufacture of menstrual cups in Japan for the domestic market], [popularization and sale at pharmacies and obstetrics and gynecology clinics], and [product modification to adapt the cup size for Japanese women] as well as [Hygienic toilet environment] related to [improvement of hand-washing facilities in toilets] were also extracted.

DISCUSSION

1. Changes to menstrual symptoms linked to the use of a menstrual cup

The MDQ scores of study participants were lower than the scores obtained in previous studies for all subscales (Goto & Okuda, 2005; Hosono et al., 2010; Tokita et al., 2009). This was presumed to be associated with the sample that only represented healthy women with sexual maturity without organic disease of the uterus.

As a result of comparing the MDQ scores of the changes in menstrual symptoms associated with the use of menstrual cups with those associated with the use of conventional sanitary products, no significant differences were observed. Scores for "cramps" were highest among the menstrual symptoms, but there was no difference in MDQ scores between the two groups, suggesting that the use of a menstrual cup would not have a worsening effect on menstrual symptoms. It is possible that anxiety and nervousness about leakage dissolve once women practice using a menstrual cup many times and become accustomed to handling the cup for insertion and removal. However, there could be a reverse effect for women who have always experienced heavy menstrual symptoms; therefore, the effects of menstrual cup use should be studied cautiously and more thoroughly in a study having a larger and more diverse sample of participants stratified by menstrual symptom severity.

2. Subjective evaluations and the possibility of menstrual cup use in Japanese women

Compared to the 82% of the participants in (Shwetha & Amritha, 2020) 's study only 45.4% of women who participated in the present study had heard of the menstrual cup. Over half had heard the term "menstrual cup" for the first time; thus, they presumably felt very anxious and nervous about using it for the first time. Moreover, 60% of the feedback of participants who used a menstrual cup for the first time was negative. Most prominently, participants often mentioned about the [discomfort when using menstrual cup] due to [pain when wearing the cup], [unpleasant sensation when inserting the cup], and [difficulty inserting and removing the cup]. However, these negative experiences associated with the use of the menstrual cup as beginners can be resolved by practicing how to fit the menstrual cup properly and through repeated use. Furthermore, reducing negative impressions of the menstrual cup such as the psychological resistance to using it and anxiety about using it for the first time is essential for promoting wider use of menstrual cups by Japanese women (Kuhlmann et al., 2017; UNICEF, 2019).

At the same time, over 70% of the feedback from the participants mentioned the benefits of physical changes associated with using the menstrual cup over conventional sanitary products. Comments about improved skin problems associated with the use of conventional sanitary products and freedom from worries about leakage; i.e., comments related to the [reduction in menstruation-related discomfort] were prominent. Furthermore, it is interesting that use of the menstrual cup generated some other miscellaneous changes, such as increased levels of interest in their own bodies during their periods. This might be conducive to acquiring appropriate menstrual coping behaviors in the context of improving women's reproductive health (Kaimura & Ueda, 2015).

Many researchers have already reported on the efficacy of menstrual cups in menstrual management (Gharacheh et al., 2021; Kakani & Bhatt, 2017; Shihata & Brody, 2019) and on the positive environmental and economic effects (Weir, 2015). Even midwives who are experts on the anatomy and physiology of the female organs were divided over whether they would eagerly continue using a menstrual cup or would rather not. However, over 70% of participants who were asked about how feasible it was for Japanese women to use them answered in the affirmative (Li et al., 2017; Varghese et al., 2015). It is important for all women to be provided the information on menstrual cups as an option for sanitary products and to choose it if it suits their individual needs.

Menstrual education in Japan is often provided only to girls after puberty in primary schools (Ikeda et al., 2013). It would be effective to introduce the menstrual cup to students in such classes as an option for menstrual management. The more alternative options there are for women, the better chances they would have in feeling secure in adverse situations or in improving quality of life. Furthermore, the reusable menstrual cup is an environmentally friendly menstrual product because it reduces the resources used for disposables and the waste it produces, thereby contributing to the realization of a sustainable society.

CONCLUSION

Twenty-two Japanese midwives were surveyed on their subjective evaluations of the menstrual cup and on changes in their menstrual symptoms resulting from using a menstrual cup. No significant differences were observed between scores of the MDQ that participants took when they were using a conventional menstrual product and when they

were using a menstrual cup, suggesting that the use of a menstrual cup would not have a worsening effect on menstrual symptoms.

To popularize the use of menstrual cups among Japanese women, it is important to combat the negative image of menstrual cup use arising from issues such as mental resistance and worries regarding first-time use.

This demonstrates that the provision of information and improved menstruation education from puberty onward to enable all women to choose the menstrual cup as a sanitary product according to their individual needs are important future issues in Japan.

Once menstrual cups are manufactured and sold domestically, the number of women who use them should increase. Therefore, further accumulation of research data on the incorporation of menstrual education to improve women's health and on the safety of menstrual cup use is awaited.

DISCLOSURE STATEMENT

The authors declare no conflicts of interest associated with this manuscript.

AUTHOR CONTRIBUTIONS

Dr. Itaya was responsible for the study conception, design, analysis, interpretation of data, and drafting of the manuscript. Dr. Kuramoto was responsible for data acquisition and proof reading of the manuscript, and she participated in the data analysis. Ms. Furukawa supervised the data analysis and proof reading of the manuscript.

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