

## A STUDY ON THE KNOWLEDGE AND ATTITUDES OF INDONESIAN WOMEN REGARDING MENSTRUAL CUPS AS ENVIRONMENTALLY FRIENDLY MENSTRUAL PRODUCTS

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### ABSTRACT

Inadequate menstrual hygiene can increase the risk of reproductive tract infections, including pelvic inflammatory disease, dysmenorrhea, and infertility. Therefore, the use of safe and effective menstrual products is essential. Currently, disposable pads are widely recognized products. Disposable pad waste is deemed environmentally detrimental, leading to an estimated annual production of 113,000 tons. Menstrual cups are a viable long-term alternative, since they can be reused for up to ten years, effectively prevent leaks, accommodate various activities, and diminish the risk of toxic shock syndrome. Examining Indonesian women's knowledge and attitudes about menstrual cups is crucial, as it substantially aids in advancing the attainment of Sustainable Development Goals (SDGs). Procedure. This was a quantitative study utilizing anonymous web-based questionnaires. Outcomes. Of the Indonesian women, 75.97% possessed limited knowledge, while only 24.03% were well-informed about menstruation cups as eco-friendly menstrual devices. 85.06% of Indonesian women were disinclined to utilize menstruation cups, while only 14.94% expressed a willingness to adopt these environmentally friendly menstrual devices. The  $p$ -value was  $0.514 > 0.05$ , which represents statistical insignificance; hence, knowledge was not associated with attitude.

**Keywords:** *attitude; knowledge; menstrual\_cup; menstruation; women\_health*

### INTRODUCTION

Each woman applies her method of maintaining menstrual hygiene according to individual preferences (Sinaga *et al.*, 2017; Gibson & Yamakoshi, 2019; Gharacheh *et al.*, 2021; Hennegan *et al.*, 2021; Sudevan Devan *et al.*, 2022; Wunsch *et al.*, 2022). Nevertheless, the presence of discriminatory societal norms, cultural taboos, limited understanding and information, and inadequate access to essential amenities like restrooms and menstruation products might result in unfulfilled menstrual health requirements (Pokhrel *et al.*, 2021; Shumie & Mengie, 2022). Poor menstrual hygiene practices can lead to mobility problems, discomfort over leakage, and odor, and increase the risk of skin irritation and reproductive tract infections. It adversely affects women's reproductive health, contributing to conditions such as pelvic inflammatory disease, dysmenorrhea, and, in severe instances, infertility (Pokhrel *et al.*, 2021; Shumie & Mengie, 2022). The prevalence of infectious diseases in the reproductive system among teenagers in Indonesia ranges from 35% to 42%, whereas among young adults, it varies from 27% to 33% (Pythagoras, 2017).

Proper management of menstrual hygiene is crucial to prevent adverse reproductive health outcomes. One example is to employ menstruation products appropriately, securely,

and efficiently. Disposable pads are commonly used in menstrual products (Pokhrel *et al.*, 2021; Sudevan Devan *et al.*, 2022; Wunsch *et al.*, 2022). Nevertheless, the amount of waste from disposable pads is expected to reach 12.3 billion pads and 113,000 tons a year, lowering the environmental health quality (Nalini *et al.*, 2022). Therefore, an effective strategy to minimize menstrual waste is to utilize sustainable and convenient menstruation products such as menstrual cups, which are both safe and environmentally friendly. Menstrual cups are silicone-based menstrual products with excellent medical safety standards and can be reused for up to 10 years. (Gharacheh *et al.*, 2021; Pokhrel *et al.*, 2021; Februadi *et al.*, 2022; Nalini *et al.*, 2022; Sudevan Devan *et al.*, 2022; Wunsch *et al.*, 2022). Furthermore, as an eco-friendly menstrual product, menstrual cups do not negatively influence the reproductive system and offer long-term cost-effectiveness compared to disposable pads and tampons. Menstrual cups are a sustainable alternative to manage menstrual hygiene. Sadly, 98.3% of Indonesian women continued to use disposable pads. The adoption of menstrual cups in Indonesia remains limited due to a lack of knowledge and education regarding their use (Warashinta, *et al.*, 2021; Februadi *et al.*, 2022). The knowledge and health attitudes of Indonesian women significantly impact the effectiveness of menstrual health management programs. Therefore, this study aimed to analyze Indonesian women's knowledge and attitudes regarding menstrual cups.

## RESEARCH METHODS

The study implemented a survey research design using a web-based anonymous online survey. The data collection period spanned May 28 to July 31, 2024.

### Research Instrument

A self-administered online questionnaire was developed, and 10 statements with a Guttman scale indicating correct and incorrect answers were used to measure Indonesian women's knowledge. The attitude questionnaire included 1 question. The questionnaire was modified from previous studies conducted by Rodriguez and Cardoso, Shelby and Puspitasari, and Sudevan Devan *et al.* (Rodrigues & Cardoso, 2021; Shelby & Puspitasari, 2022; Sudevan Devan *et al.*, 2022). An English professional translated the questionnaire into Bahasa Indonesia and thereafter reviewed it for content validity by experts in public and reproductive health. To assess the validity and reliability of the scale, a pilot study was conducted with 30 respondents. Moreover, Cronbach's alpha values were calculated for the instrument's reliability, resulting in an acceptable range of 0.615. Questionnaires were also used to collect data.

### The respondent

The respondents in this study were voluntary, meaning that they willingly agreed to participate without compulsion. The respondents met the specified inclusion criteria.

1. women who experienced menstruation
2. Women with normal reproductive systems and no illnesses or abnormalities.
3. Women were within the reproductive age range of 13–50 years.

### Statistical Analysis

Descriptive statistics were employed to identify the demographic characteristics of the respondents, which are also presented in the tables. The Kolmogorov–Smirnov test was used to analyze the data distribution. Owing to the non-normal distribution of the data, respondents' knowledge and attitudes were categorized according to the median score. The median score were 8.5. Consequently, scores of 8.5 or higher indicated good understanding, while scores below 8.5 reflected poor knowledge. At the same time, the median score for attitude is 0.8. The respondents were classified as willing to use a menstruation cup if their scores were  $\geq 0.8$ , and as unwilling if their scores were  $< 0.8$ . Spearman's rank correlation coefficient was used to assess the relationship between variables, with a  $p$  value of less than 0.05.

## RESULTS AND DISCUSSION

### Characteristics of the respondents

The study included 154 respondents who matched the inclusion criteria (**Table I**). The study respondents were from 19 provinces in Indonesia. Of all respondents, 61% had heard of menstrual cups. However, despite this awareness, all respondents continued to use disposable pads as their preferred product for menstruation. The provincial origins and educational levels of Indonesian women do not correlate with their knowledge of menstrual cups as environmentally friendly menstrual products. The  $\rho$  values for provincial origins and education levels were 0.179 and 0.111, respectively, indicating a statistical insignificance.

**Table I. Characteristics Of the Respondents**

Items	n	%	Knowledge
<b>Provinces</b>			
Aceh	1	0.65	$\rho$ -value 0.179
Banten	7	4.55	
Bengkulu	2	1.29	
D.I Yogyakarta	10	6.49	
DKI Jakarta	19	12.34	
West java	64	41.56	
Central Java	9	5.84	
East Java	11	7.14	
North Kalimantan	1	0.65	
West Kalimantan	3	1.95	
East Kalimantan	5	3.25	
Lampung	7	4.55	
West Nusa Tenggara	1	0.65	
East Nusa Tenggara	1	0.65	
West Papua	1	0.65	
Riau	5	3.25	
South Sulawesi	2	1.29	
West Sumatera	2	1.29	
South Sumatera	3	1.95	
<b>Education</b>			
High School	43	27.92	$\rho$ -value 0.111
Diploma	19	12.34	
Bachelor	57	37.01	
Master	34	22.08	
Doctor	1	0.65	
<b>Have you heard of menstrual cups?</b>			
Yes	94	61	
No	60	39	
<b>Utilized menstruation products</b>			
disposable pads	154	100	
others	0	0	

### Frequency distribution of Indonesian women's knowledge of menstrual cups

Most respondents were aware that menstruation cups are commonly made up of rubber, silicone, or latex. Additionally, some respondents recognized that menstrual cups are an environmentally sustainable option among menstrual devices. However, they were unaware that menstrual cups had a lifespan of up to 10 years. Most respondents were unaware of the availability of menstruation cups of various sizes and price ranges. Most respondents were unaware of the proper techniques for utilizing and extracting menstruation cups. Additional information is presented in **Table II**.

**Table II. Frequency Distribution of Indonesian Women's Knowledge of Menstrual Cups**

No	Items	Correct	%	Incorrect	%
1	Menstrual cups are made of silicone, rubber, latex, or elastomer which have high medical safety qualities	117	75.97	37	24.03
2	Menstrual cups are available in several sizes (small, medium, large)	20	12.99	134	87.01
3	The price of a menstrual cup ranges from IDR 150,000-IDR 700,000	17	11.04	137	88.96
4	The usage time of a menstrual cup can last up to 12 hours	37	24.03	117	75.97
5	Menstrual cups can be reused for up to 10 years	48	31.17	106	68.83
6	To use a menstrual cup, fold the cup hole and gently insert it into the vagina.	28	18.18	126	81.82
7	To remove a menstrual cup, gently pull the bottom end of the cup	26	16.88	128	83.12
8	To clean a menstrual cup, use clean water or soap, then dry it	124	80.52	30	19.48
9	To sterilize a menstrual cup, boil it in boiling water for 10 minutes, then cool and dry it	137	89	17	11
10	Menstrual cup sterilization can be done at the beginning before use and at the end of the menstrual period	122	79.22	32	20.78

### Knowledge and attitudes of Indonesian women regarding menstrual cups

The knowledge analysis results indicate that 75.97% of Indonesian women possess an insufficient understanding of menstruation cups as environmentally sustainable menstrual products. Approximately 85.06% of Indonesian women remain unwilling to use menstruation cups as an eco-friendly menstrual solution. The  $p$ -value was  $0.514 > 0.05$ , indicating statistical insignificance; thus, knowledge was not correlated with attitude. Comprehensive information is provided in [Table III](#).

**Table III. Knowledge And Attitudes of Indonesian Women Regarding Menstrual Cups**

Items	n	%	
<b>Knowledge</b>			
Good knowledge	37	24.03	
Poor knowledge	117	75.97	
<b>Attitudes</b>			
Willing to utilize a menstruation cup	23	14.94	$p$ -value 0.514
Unwilling to utilize a menstruation cup	131	85.06	

### Discussion

Menstruation is a natural process in women, characterized by the release of the endometrial lining, full of blood vessels, occurring approximately every month for an average of 5 to 7 days. The menstrual cycle typically occurs between the ages of 13 and 50 ([Kementerian Kesehatan RI, 2018](#); [Shumie & Mengie, 2022](#)). Menstruation is an essential aspect of women's reproductive health and requires proper management because of its considerable influence on their physical, emotional, and social well-being ([Kementerian Pendidikan dan Kebudayaan RI, 2017](#); [Critchley et al., 2020](#)).

This study used a questionnaire to assess Indonesian women's knowledge and attitudes toward menstruation cups as an eco-friendly menstrual product. The study's findings showed that approximately 75.97% of Indonesian women had poor knowledge, whereas only 24.03% exhibited considerable knowledge regarding menstrual cups as eco-friendly menstrual products. This study found no correlation between provincial origins or education levels and Indonesian women's knowledge of menstrual cups as environmentally friendly.  $p$ -values of 0.179 and 0.111 indicate the insignificance of the province of origin and education level, respectively. A higher level of education does not necessarily suggest a better understanding of menstrual cups. An individual's knowledge is influenced by information acquired from diverse sources and possibly influenced by different social and economic contexts (Solehati *et al.*, 2018; Rodrigues & Cardoso, 2021; Widya & Usman, 2022). In this study, most Indonesian women were aware of menstrual cups, but never utilized them. Many Indonesian women lack knowledge of the usage and removal of menstrual cups, their appropriate length and duration of use, and their sizes and prices. Some respondents recognized that menstrual cups are considered an environmentally sustainable option among menstrual devices, but they were unaware of the fact that menstrual cups have a lifespan of up to 10 years. This phenomenon also arises from insufficient information on the issue (Rodrigues & Cardoso, 2021; Warashinta *et al.*, 2021; Februadi *et al.*, 2022). Most women experience uncertainty regarding their identification of trustworthy information sources. Women typically acquire information and advice regarding menstrual cups through social media and their acquaintances (Shelby & Puspitasari, 2022; Sudevan Devan *et al.*, 2022; Ramsay *et al.*, 2023). Media, particularly social media, significantly contribute to the dissemination of information because of its accessibility and affordability for millions of people (Al-Metwali *et al.*, 2021). An individual's knowledge is influenced by the information acquired from diverse sources. The more accessible the information is to an individual, the greater their knowledge will be (Solehati *et al.*, 2018; Widya & Usman, 2022). Educators, health professionals, parents (especially mothers), and relevant organizations must conduct health education programs regarding menstrual hygiene management and diverse menstruation products to enhance women's knowledge (Sommer & Sahin, 2013; Puspitasari *et al.*, 2020; Munro *et al.*, 2022; Sudevan Devan *et al.*, 2022; Ramsay *et al.*, 2023). Health education regarding menstrual management should commence throughout adolescence and childhood. Prior qualitative research involving adolescent girls reported that education in menstrual biology and management enhanced their menstrual confidence by providing them with knowledge about what to anticipate and how to prepare for their menstrual periods. However, it is difficult to observe from numerous studies that educators and organizations are inadequately addressing the education of teenagers regarding Menstrual Health Management. Information provided to females before menarche in schools is minimal. Research has shown that most educators are inadequately equipped to discuss this topic with girls, despite its inclusion in the school curriculum (Shrestha *et al.*, 2020; Munro *et al.*, 2022).

The study's findings on Indonesian women's attitudes towards menstrual cups as eco-friendly menstrual products revealed that 85.06% were unwilling to use them, while only 14.94% expressed a willingness to start using them. This study found no correlation between Indonesian women's knowledge of and attitudes regarding their willingness to use menstrual cups. A  $p$ -value of  $0.524 > 0.05$ , indicates statistical insignificance. Most Indonesian women were unwilling to use menstrual cups. This is because of the perception that menstrual cups are relatively costly. Thus, the initial financial investment is expected to be substantial. They also evaluated whether the value of the health advantages they will obtain is commensurate with the cost of purchasing a menstrual cup. This may be related to cultural and socioeconomic differences within the society (Beksinska *et al.*, 2021; Rodrigues & Cardoso, 2021; Sudevan Devan *et al.*, 2022). Another frequently mentioned reason is the insufficient information and accessibility of the menstrual cup, together with the potential challenges in its insertion and removal. Discomfort is frequently mentioned as a reason for this.

Nevertheless, certain research shows that this challenge is surmounted by the accumulation of experience over time. Furthermore, cleansing between applications or alterations as well as the potential for leaks resulting from improper positioning (Mason *et al.*, 2015; Manley *et al.*, 2021; Rodrigues & Cardoso, 2021; Shelby & Puspitasari, 2022). Menstrual cups are less prevalent in Indonesia than are disposable pads. The proper information and understanding of menstrual cups are insufficiently understood among women (Shelby & Puspitasari, 2022). Despite the flexibility of the menstrual cup, its reusability for up to 10 years, and efficacy in minimizing menstrual waste (Gharacheh *et al.*, 2021; Pokhrel *et al.*, 2021; Februadi *et al.*, 2022; Nalini *et al.*, 2022; Sudevan Devan *et al.*, 2022). Certain Indonesian women with good knowledge and a willingness to utilize menstrual cups are environmentally sustainable, do not adversely affect reproductive health, and offer long-term cost-effectiveness compared to disposable pads and tampons. Long-term expense savings would be realized after one year of utilization. Menstrual cups are a sustainable alternative for managing menstrual hygiene (Beksinska *et al.*, 2021; Gharacheh *et al.*, 2021; Pokhrel *et al.*, 2021; Nalini *et al.*, 2022; Sudevan Devan *et al.*, 2022). The greater environmental advantages of menstrual cup utilization would result in savings in costs associated with waste minimization and the preservation of delicate water systems (Beksinska *et al.*, 2015).

Indonesian women require collaboration and involvement from all stakeholders. Communicating information regarding menstrual cups as environmentally friendly products requires enhancement through more appealing and detailed visualizations, including consistent execution of health education, promotion, and oversight by qualified health professionals. This can also mitigate and counteract misinformation disseminated online, including on social media and television (Sulistyawati *et al.*, 2021; Shelby & Puspitasari, 2022). It is essential for teachers, healthcare workers, parents (particularly mothers), and relevant institutions to implement health education programs focused on menstrual hygiene management and the variety of menstruation products available to improve women's understanding. Health education on menstrual management should begin during adolescence and childhood. Education on menstrual biology and management improves menstrual confidence by equipping individuals with knowledge regarding expectations and preparation for menstrual periods (Sommer & Sahin, 2013; Solehati *et al.*, 2018; Puspitasari *et al.*, 2020; Munro *et al.*, 2022; Sudevan Devan *et al.*, 2022; Ramsay *et al.*, 2023).

To the best of our knowledge, this study is one of the first to assess the knowledge and attitudes of Indonesian women regarding menstrual cups nationally. This study has limitations that must be acknowledged when interpreting the results. Using online surveys will exclude groups with limited internet access, which may induce sample bias, rendering the results potentially non-generalizable to the broader population, as seen by the insufficient representation of several provinces in Indonesia. Utilizing messaging applications and social media to disseminate the survey link across network members may lead to selection bias, owing to the unrepresentative characteristics of contact network membership. Moreover, the participants' replies were derived from self-reports, which introduces the potential for self-reporting bias.

## CONCLUSION

The survey concluded that 75.97% of Indonesian women possess limited knowledge, while only 24.03% exhibit a high level of understanding about menstrual cups as eco-friendly menstrual devices. Of the Indonesian women, 85.06% were unwilling to use menstruation cups, while only 14.94% expressed a willingness to embrace these environmentally friendly menstrual devices. The  $p$ -value was 0.514, above 0.05, which represents statistical insignificance; hence, knowledge was not associated with attitude.

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