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Knowledge and acceptabilty of the menstrual cup among medical practitioners working in obstetrics and gynaecology department

Chuene, Sekedi Yvette

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KNOWLEDGE AND ACCEPTABILTY OF THE MENSTRUAL CUP AMONG MEDICAL PRACTITIONERS WORKING IN OBSTETRICS AND GYNAECOLOGY DEPARTMENT



UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

Dr. Sekedi Yvette Chuene

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Medicine in Obstetrics and Gynaecology.

2022

DEDICATION

I dedicate this paper to my husband Mabua, my absolute pillar of strength. Your unfailing support and love was all I needed to get through this tough time. To my son ‘bubu’, everything I ever did, was all for you. To my late father and my dearest mother, thank you for always believing in our dreams.

ACKNOWLEDGMENTS

I would like to extend a special thank you to my Supervisors, Dr Langanani Mbodi and Dr Vusumuzi Maringa for the constant encouragement and support and pushing all of us to be a better version of ourselves. None of this would have been possible without you. I am forever grateful. Thank you for helping me to achieve my FCOG dream.

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UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

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SENATE PLAGIARISM POLICY: APPENDIX ONE

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LIST OF ABBREVIATIONS

CHBAH:	Chris Hani Baragwanath Academic Hospital
CMJAH:	Charlotte Maxeke Johannesburg Academic Hospital
LMIC:	Low-and-middle income countries
MHM:	Menstrual Hygiene Management
RMMCH:	Rahima Moosa Mother and Child Hospital
TSS:	Toxic Shock Syndrome
TSST-1:	Toxic Shock Syndrome Toxin-1
UNFPA:	United Nations Population Fund
WASH:	Water, Sanitation and Hygiene
WHO:	World Health Organisation
WITS:	University of the Witwatersrand

DEFINITION OF TERMS

1. Consultant:

   A Medical practitioner who holds an undergraduate degree in medicine as well as completed medical training in specialised area of medicine, in this study, Obstetrics and Gynaecology.

2. Medical officer:

   Doctor in a non-training post, who is practising under the supervision of a consultant.

3. Medical practitioners:

   In this study, medical practitioners shall include all practitioners registered with Medical and Dental Board of the Health Professions Council of South Africa. Therefore, it encompasses the Medical Officers, Registrars, and Consultants.

4. Menstrual cup:

   Funnel-shaped receptacles that can be inserted into the vagina during the menstrual cycle for collection of menstrual fluid

5. Menstrual hygiene management (MHM):

   "Women and adolescent girls using a clean material to absorb or collect menstrual fluid, and this material can be changed in privacy as often as necessary for the duration of the menstrual period. MHM includes soap and water for washing the body as required, and access to facilities to dispose of used menstrual management materials." WHO (2012)

6. Menstrual hygiene products:

   Products used for menstrual fluid collection, for example, cloths, sanitary pads, tampons, menstrual cups.

7. Registrar:

   Medical practitioners undergoing training as Specialist in a particular discipline of medicine. In this study, Obstetrics and Gynaecology.

8. WASH:

   Water, sanitation, and hygiene facilities that are essential for adequate MHM. Entails a private safe space for changing materials, soap, and water to maintain personal hygiene.

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ABSTRACT

Background

Menstrual cups are funnel-shaped receptacles that collect menstrual fluid. There is clear evidence for the benefit of the menstrual cup usage among girls and women, especially in resource poor settings. The device has modest cost-savings, improves menstrual hygiene management and aids in contribution to the advancement of women who were previously disadvantaged by lack of sanitary products. The menstrual cup has been around for centuries but still remains unfamiliar to many. There are misconceptions amongst the general public regarding menstruation as well as its management. Many of the misconceptions are closely linked to the social background as well as the upbringing and cultural factors. Those misconceptions are also seen in health care workers. Medical practitioners are trusted throughout the communities to be advocates for the health of all. Advocating for something is linked to the knowledge that one would have on the subject, in order to be able to promote it adequately.

Objective: To assess the knowledge of the menstrual cup among medical practitioners in the Department of Obstetrics and Gynaecology. To assess if the medical practitioners would recommend the usage of the menstrual cup to their patients. To assess the factors that may deter them from recommending its usage.

Study methods: A cross-sectional study using a self-administered questionnaire given to medical practitioners in the Department of Obstetrics and Gynaecology, the University of the Witwatersrand. Analysis of data was performed using SPSS® Statistics version 23.0, Armonk, New York, 2015.

Results: There were 58% of participants who had knowledge of the menstrual cup. There was no association found between knowledge of menstrual cup and the participants race, age, gender, academic level or work experience. Only 12 % of practitioners reported that they would recommend the cup for usage to their patients. Reasons for lack of recommendation included lack of knowledge and lack of experience with the menstrual cup. The most common complication of the cup was thought to be infections.

Conclusion: To the best of our knowledge, this study is the first to assess knowledge of menstrual cup among medical practitioners in South Africa. It has highlighted the need for menstrual hygiene management teaching among medical practitioners. An in-depth knowledge may assist medical practitioners in discussing alternative menstrual hygiene management options with their patients.

CHAPTER 1: INTRODUCTION AND BACKGROUND

Throughout centuries, menstrual management has always posed a challenge to women. The main challenge with menstruation, that may be taken for granted, is how to manage menstrual flow and what happens when women or girls are unable to do so successfully (1). Menarche signifies the start of the reproductive years and transition from childhood to full adult status within a community. Menstruation, a normal physiological process, has always been surrounded by stigma. Frequently dubbed as 'the period' or 'time of the month', menstruation is often linked with cultural and religious beliefs that influence how women and girls perceive it, as well as how it is managed. However, it is often associated with connotations that are dirty or shameful (2,3). Menstrual technology (inventions, products, or innovations created to use in menstrual management) has evolved over the centuries (4). Several patents were issued from 1854 to 1921 for various products ranging from bandage suspenders, napkins, and menstrual cups (3).

As women's roles in society evolved, so did the need for more compact and discrete products that enabled a woman to carryout daily duties without the worry of leakage. Due to different marketing strategies, some products fell out of favour, such as the menstrual cup, which only re-emerged 50 years after being patented. Its revival was witnessed in the 1970s with a new feminist and environmental movement that supported the use of sustainable, reusable products (5). With a global estimate of 1,9 billion women being of menstruation age in 2017, one can only begin to imagine how many feminine hygiene products are consumed and discarded daily (6).

Menstrual cups are funnel-shaped receptacles that can be inserted into the vagina during the menstrual cycle to collect menstrual fluid. Two types of cups are available, a vaginal cup, which is placed in the vagina, and a cervical cup, which is like a contraceptive diaphragm and is placed around the cervix (3,7). Depending on the type of cup, they have a capacity of up to 38ml. Emptying of the cup is required every 4-8 hours, however, can be up to 12 hours depending on the menstrual flow. After the cup is removed, it is emptied, rinsed, and re-inserted into the vaginal canal. At the end of each menstrual cycle, it is then sterilised, either by boiling or with a sterilising solution. It is reusable for 5 to 10 years, depending on the brand. The latest models

are made from flexible medical grade silicone. Most brands come in 2 sizes: a smaller one for the nulliparous woman, and a larger one recommended for women who are over 30 years of age and those who have given birth vaginally (7).

Menstrual cups have been around since 1867 when the first device, the Hockert Catamenial Sack, was patented. However, it was only in 1937 that the first usable commercial menstrual cup was invented & patented by American actress Leona Chalmers. The early menstrual cup was made from vulcanised rubber, which was part of the reason why they were not commercially viable. In the first half of the twentieth century, women adopted menstrual pads but were hesitant to try tampons and menstrual cups. It may be because they found insertable products to be socially and culturally unacceptable (8). The use of the cups may have also been limited by the difficulty in insertion. They do not compress easily and need to be squeezed tightly into a folded position. Even after insertion, orientation in the vaginal canal may still be required (3).

Cumulative evidence from Africa and other low and middle-income countries (LMICs) suggest that menstrual hygiene management (MHM), or the lack thereof may be preventing the advancement of women and girls in the community (9). MHM was defined by the World Health Organisation (WHO) in 2012 as: “Women and adolescent girls using a clean material to absorb or collect menstrual blood, and this material can be changed in privacy as often as necessary for the duration of the menstrual period. MHM includes soap and water for washing the body as required, and access to facilities to dispose of used menstrual management materials” (6,10).

In LMICs, women and girls are challenged with barriers that prevent them from achieving adequate MHM. The main restrictions faced are due to the lack of affordable menstrual products (1, 11, and 12). Consequently, many women and girls in resource-poor countries are resorting to usage of toilet paper, newspaper, or a cloth that can be washed and reused. These alternatives cause discomfort and often leak. In a recent systematic review, it was found that girls from resource-poor countries often attributed school absenteeism to difficulties in managing their menses. The absenteeism was also closely linked to the limitation of water, sanitation, and hygiene (WASH) facilities as well as the lack of privacy at the schools (1,2). This was substantiated by a report from the WHO in 2010 (13).

A South African sanitary pads campaign launched in 2014 reported that almost nine million girls aged 13-19 missed school during menses due to a lack of sanitary products (14). A 2018 qualitative study in Uganda reported that embarrassment and fear of teasing, together with a lack of materials for MHM, led to absenteeism at school. Absenteeism was reported on 28% of menstrual days as compared to 7 % of non-menstrual days (15). Schoolgirls living in rural areas were prone to be absent more than those in urban areas. This could be because those in rural areas were more likely to have inadequate menstrual products due to expense. Other reasons cited for absenteeism were menstrual pain, belief that menstruation should be kept a secret, fear of staining clothing and lack of privacy in school toilets (16).

There was however a feasibility study done in rural Kenya that investigated what effect providing menstrual cups versus pads to schoolgirls, had. The findings showed that the interventions did not affect school absenteeism. Among the cup, pad, and control arms of the study, bacterial vaginosis was found to be less prevalent in the cups arm of the study (17). On further analysis of the data, it was found that there was generally an underreporting of school absenteeism among the schoolgirls (17). A study in Ghana demonstrated that puberty education intervention with the supply of sanitary pads had a significant improvement in school attendance (18). Another study in Kenya demonstrated that the provision of menstrual cups may enhance mobility and convenience and may reduce distractions associated with leakage (2).

Even though disposable products may be desirable to many girls, there are often financial constraints that prevent them from being able to access those products. Almost all the 102 girls in a Kenyan study leaned towards sanitary pads for their convenience and reliability, but almost half of them used a reusable cloth in order to save money (2). Due to lack of money, schoolgirls are susceptible to sexual and reproductive health harm. A lack of MHM materials can be an instigating factor for girls' vulnerability to coercive sex (19). In a Kenyan study, 10% of 15-year-old girls reported that they had transactional sex to obtain money to buy sanitary products (19).

Some various organisations and activists that have aimed to improve MHM by encouraging

government involvement to support menstrual health. In January 2011, the SA government vowed to provide free sanitary pads to females who could not afford them (20). However, disposable products also have a significant environmental impact. A South African study done by Scorgie F et al., looked at women's beliefs and practices around menstruation in context to their sanitation environments. The study highlighted that there is still a lack of disposal options for non-biodegradable menstrual products. Furthermore, improper handling of used products often led to blocked sanitation systems which result in considerable expenses to the municipalities. Improper disposal can also pose health risks to both users and sanitation workers (21). Their findings are echoed in a literature review by Elledge MF et al. who assessed MHM and waste disposal in LMIC, and the deficiencies thereof (22).

It is estimated that approximately 3.7 million girls in South Africa are unable to afford sanitary pads (23). The cost of menstrual tampons in 2018 was estimated to be R1.50 each (which amounts to R15 for a box of 10 tampons) as compared to R18 for a packet of 10 sanitary pads. This equated to approximately R16,500 and R19,800 for each product respectively, which a female would ultimately spend throughout her lifetime on sanitary products (23). Various countries in Africa have since piloted and studied the effects of the menstrual cup in adolescent girls as a means of providing safe, clean, and cost-effective solutions to menstrual management. Menstrual cups provide an alternative to disposable hygiene products (11,14). In South Africa, the Teddy Bear Clinic introduced the Mina Cup (a reusable menstrual cup that retails for R250 per unit) as an initiative to aid in menstrual management (24). According to the Mina Foundation, they estimate that 251 136 tampons and 2 009 088 pads could be saved per year, if women agreed to utilise the reusable menstrual cup (25).

The menstrual cup is an ideal solution to the menstrual hygiene management issues faced by women and girls in resource-poor countries (6,8,11,14,17,26). However, some challenges may be faced through the wide use of menstrual cups, as identified by the African Population and Health Research Centre in 2010 (27). There may be a failure to wash the menstrual cup with each removal and reinsertion as well as poor hand hygiene. This is compounded by the shortage of WASH facilities, especially in school establishments. Others may fail to sterilise the cup after each menstrual cycle, leading to a possible build-up of organisms on the cup (27). The biggest risk of a reusable product in a resource-poor country is the possibility of sharing the

cup among different users, but that can be prevented through adequate education of the users (26).

Many good things have been said about the menstrual cup, but is it harmless? There are minimal side-effects that have been cited in the literature. Most are published as case reports that demonstrate the very rare, but serious dangers of the menstrual cup. In a case report by Stolz et al., there is an account of a 47-year-old female patient who developed hydronephrosis due to an improperly positioned menstrual cup that had caused bladder entrapment. The symptoms settled upon the removal of the menstrual cup. From their observations, they concluded that it was incorrect positioning of the cup that obstructed the ureters. Furthermore, they also speculate that since blood accumulates in menstrual cups, it may lead to retrograde menstruation, and can increase the risk of endometriosis (28).

Another concern is that there is a risk that the cup can interact with other active sexually transmitted infections in the lower genital tract, further propagating the infection (6,27). A case report of *Chlamydia trachomatis* (C. trachomatis) and pelvic inflammatory disease (PID) with menstrual cup usage as a precipitating event was presented by Jayakody et al. A 31-year-old female presented with peritonitis which occurred concurrently with the use of menstrual cup. Laparoscopy revealed a hyperaemic uterus and ovaries with turbid fluid in all four quadrants. Both endocervical swab and peritoneal fluid microscopy and culture were positive for C. trachomatis. The authors presumed that the female perhaps had a pre-existing asymptomatic untreated C. trachomatis infection. They also proposed that the menstrual fluid in the cup had provided a growth medium for the organism to multiply resulting in acute PID and peritonitis, concluding that menstrual cups can convert asymptomatic infections to overt infections in high-risk women (29).

Nunes-Carneiro et al., noted an incident of a 26-year-old menstrual cup user, who presented with renal colic and was found to have right uretero-hydronephrosis extending to the right distal ureter. They concluded that there may have been mechanical compression by the menstrual cup that had caused her symptoms. Symptoms resolved upon removal of the device (30). Perhaps the most serious side-effect reported is that of menstrual toxic shock syndrome (TSS) in correlation with the use of the menstrual cup. In the case reported by Mitchell et al., the incident fulfilled all criteria of a ‘confirmed’ case of TSS. Because of the accumulation of blood,

menstrual cups may provide a medium for *Staphylococcus aureus* growth with subsequent production of TSS toxin-1 (TSST-1) which leads to multi-organ failure (31). These results were echoed by an in vitro study performed by Nonfoux et al. in 2018 (32).

A meta-analysis by van Eijk et al., of 43 studies (3319 women) assessed menstrual cup use, leakage, acceptability, safety, and availability. They reported that the menstrual cup showed no changes in vaginal flora (four studies, 507 women). However, they identified five women who reported vaginal pain and wounds, six reports of allergies, nine reports of urinary tract symptoms and, five reports of TSS following the use of the menstrual cup. Those that required professional assistance for cup removal were 47 (7). The safety of the menstrual cup was also examined in primary school girls in rural western Kenya and among the 604 girls tested, no adverse event was noted (33). van Eijk et al. also further demonstrated that the menstrual cup was a safe and internationally acceptable option for MHM (7). There is currently an ongoing study by Zulaika et al. in western Kenya. Their objective was to determine if the provision of menstrual cups together with or without cash transfer can reduce sexual and reproductive harm as well as school dropout in teenage girls. (19). Evidence from this study could potentially improve attendance at school in LMICs.

The big question is, do girls and women find the menstrual cup acceptable as an MHM product? One of the first advertisements published in Photoplay magazine in 1937 described the first menstrual cup as "…so comfortable you'll never feel it… so secure you'll always be at ease." (5). Multiple studies that have shown that menstrual cups are acceptable in women and especially girls of school-going age. A 2015 randomized crossover study by Beksinka et al., looked at the acceptability and performance of the menstrual cup in SA in comparison to the tampon or sanitary pad. They enrolled 110 women in the study. It was found that the menstrual product used most frequently by most women, was the sanitary pad. By end of the study, most women could use the menstrual cup successfully. In total, 90% of women were willing to continue its usage and recommend it to others. The menstrual cup was rated better overall in terms of its comfort, calibre, blood collection ability, aesthetics, and general preference (11,14).

Numerous studies demonstrate that even if many women find a lot of difficulties with insertion, removal, and comfort, it improves over months of usage. They require support, instruction, and

persistence with the products (3,6,34–36). van Eijk et al. also performed a feasibility study in rural western Kenya, assessing the use of menstrual cups as a solution to MHM in economically challenged settings. Their results showed that the girls can use the menstrual cup with uptake improving over time and with education (8). A multicentre randomised controlled trial in Canada compared tampons versus menstrual cups, showed that menstrual cups were an agreeable alternative to tampons and have the prospect of being a sustainable solution that will have reasonable cost savings with a decreased environmental impact as compared to tampons (36). However, cultural factors regarding virginity and hymen integrity that could be compromised by the insertion of menstrual cups may also affect its usage in certain cultures as they may not find it to be acceptable. There are also false beliefs that it could lead to arousal of sexual feelings, as it involves touching of the genitals during insertion (7).

Over the years, the role of the medical profession in the development of menstrual products is unknown, and no medical warnings given against the use of menstrual devices are found in the literature. However, there is a suggestion that physicians and other medical professionals were involved in menstrual product distribution (4). There were, however, medical practitioners such as Dr. E. Clarke, that argued against educating women about their menstrual period (3,4). He also stated that menstruation was a liability for women and popularised the notion that women and girls be given a mandatory rest period during their cycles (4,5,37). The inaccurate statements made by Clarke were followed by many physicians until the late 1800s and influenced the political scene. It was only in the 1910s that female physician Clelia Mosher disputed and argued for the normalcy of menstruation (37).

The above highlights the substantial influence that medical practitioners have on the community at large. The menstrual cup has been around for centuries, but its use has always been limited despite its clear benefits. Since the menstrual cup has been shown to be a sustainable MHM product, especially in resource-poor countries such as SA, with modest cost savings in the long run, as well as environmental benefits, we should consider how it can be promoted in the community. Medical practitioners are trusted and could be used as a tool for promotion of its use.

In the literature review, hardly any articles have been published that discussed the knowledge of medical practitioners on menstrual cups or their influence on its use and distribution. We found only one cross-sectional study from India by Divakar H. et al., looking at the knowledge, attitudes and, practices of obstetricians and gynaecologists on the usage of menstrual cups. They conducted a questionnaire-based study on 163 practitioners in both public and private sectors in Bangalore, India. The demographics of their study population were not stated. The questionnaire consisted of 20 questions regarding advocacy of menstrual cups, health, hygiene, and, contraception as well as feedback from young girls regarding the usage of menstrual cup.

Their results showed that 92% of practitioners had never in any discussions, included menstrual cups as an alternative menstrual management product. Even though 75% of them had discussed menstrual cups in health talks, only 17% discussed them in their consultation rooms. In addition, 93% of them considered menstrual cups to be environmentally friendly, but only 59% think that menstrual cups are the way forward in MHM. Though 51% thought it is appropriate to recommend usage in young girls, only 35% of them have proactively suggested it to them, irrespective of their sexual activity. They also found that 41% of girls had approached health care providers about the usage of menstrual cup but, 71% of the girls had obtained information from their peers and the internet (38).

Another study conducted in Pakistan by Ali S. et al., found that 57.6% of healthcare workers (which included resident trainees, physicians, nurses, and interns) were unaware of the menstrual cups. In this study they were comparing the perceptions and practices regarding menstrual hygiene between females in the general population and female health care workers. They also concluded that even the health care workers were harbouring some misconceptions regarding menstruation and its management (39). Another study by Eti M. et al. conducted on 400 female medical students at Rajarajeswari Medical College and Hospital showed that only 7% of them didn't know what a menstrual cup was. Of those who knew it, 70.4% thought that it was for menstrual collection in sexually naïve females. The participants did not know what the cup was made of, how it is used or cleaned. All the students in their study used sanitary pads due to its popularity. None of them had used the menstrual cup. Majority of the participants (76.6%) were comfortable with sanitary pads, 15.8% were unsure if it could be utilised by girls who were still virgins and 7.5% of participants were unsure of the insertion and removal process (40).

In this study, we will be assessing medical practitioners' knowledge of the menstrual cup as an MHM and whether they are likely to accept its use and encourage others to use them. Hopefully the results of this study may help us map a way to contribute to improving the menstrual health management in girls and women.

CHAPTER 2: RESEARCH METHODOLOGY

AIM

This study aimed to assess the knowledge and acceptability of the menstrual cup among medical practitioners in the Department of Obstetrics and Gynaecology at the University of the Witwatersrand.

OBJECTIVES

The objectives of the study were to:

a) To assess knowledge of the menstrual cup in medical practitioners in obstetrics and gynaecology department.
b) To assess if the medical practitioners would recommend the usage of the menstrual cup to their patients and other members of their communities.
c) To describe health practitioners' related factors that may contribute to their likelihood to recommend or not recommend the use of the menstrual cup.

STUDY DESIGN:

This was a prospective, cross-sectional study using a self-administered questionnaire given to medical practitioners in the department.

STUDY SETTING:

The study was conducted at the Department of Obstetrics and Gynaecology, the University of the Witwatersrand.
The hospitals that were included were:

- Chris Hani Baragwanath Academic Hospital (CHBAH)
- Charlotte Maxeke Johannesburg Academic Hospital (CMJAH)
- Rahima Moosa Mother and Child Hospital (RMMCH).

STUDY POPULATION:

The study population included 69 medical practitioners in the Department of Obstetrics & Gynaecology, the University of the Witwatersrand, working at CHBAH, CMJAH, and RMMCH.

a) Inclusion criteria:
   i. Medical practitioners employed in the Department of Obstetrics and Gynaecology, the University of the Witwatersrand, at the period of study, who consent to partake in the study irrespective of their duration of practice or employment.

b) Exclusion criteria:
   i. Any medical practitioner who is visiting or performing any other work in these centres but not employed in the Department of Obstetrics and Gynaecology, the University of the Witwatersrand.
   ii. Any practitioner who declines to participate in the study.
   iii. Any practitioner who is unable to complete the questionnaire at the designated time and place that is set.
   iv. Any practitioner who is does not understand English as the questionnaire was not translated into any other languages
   v. Medical interns

SAMPLE SIZE CALCULATION:

In each rotation, the Department of Obstetrics and Gynaecology, the University of the Witwatersrand has a total of 113 practitioners (MOs and Registrars (overall total): 65, Consultants: 25,10, 13 (CHBAH, CMJAH, RMMCH respectively).
An Indian study of 163 medical practitioners in O&G found that 75% of practitioners were willing to discuss menstrual cups in health and hygiene programs. Utilising this generic information, we calculated our sample size using the formula (41):

Sample size = $Z_{1-\alpha/2}^2\, p(1-p)/d^2$

$= 1.96^2 \times 0.75(1-0.75)/0.05^2$

$= 288.12 \approx 288$

With likelihood of a 20% dropout or declining to participate, the sample size was estimated to drop down to 230 medical practitioners.

Where $Z_{1-\alpha/2}$ is standard normal variant at 5% type 1 error, 1.96,

P is the expected proportion in population based on previous study and

D as the absolute error /precision of 5% (0.05)

DATA COLLECTION:

A self-administered questionnaire (Appendix A) written in the English language was used. The questionnaire (Appendix A) was in paper form, handed out individually to study population within the designated hospitals on the same day. These were handed out to all members present on the day of data collection. A picture of the actual menstrual cup taken when it was opened to its maximum capacity, was displayed on the questionnaire. Practitioners were asked if they knew what the device was, with clear instructions not to share answers.

Participants' inferred consent to participate in the study by completing the questionnaire, after reading the information pamphlet. Completed and folded questionnaires were deposited into a box labelled "Completed Questionnaires" to ensure participant anonymity was maintained. The primary investigator collected all the boxes from the office of the departmental secretary in each department.

STATISTICAL ANALYSIS:

Data collected was loaded onto Excel worksheet, coded, and cleaned for the statistical analysis software. Analysis was performed using SPSS® Statistics version 23.0, Armonk, New York, 2015. A statistician with a background of clinical medicine or who has analysed data for clinical medicine, was employed to help analyse the data further. Discrete variables were reported in frequencies and percentages. Continuous variables were calculated according to means and medians.

The P-value was set at 0.05. If the P-value is less than 0.05, then the null hypothesis would be rejected. The Chi- square test was used as a test of significance when the following criteria was met:(42)

1. All values are in actual numbers.
2. There was no use of percentages or averages.
3. The value in all the cells was more than five or more
4. The sample should have been randomly drawn.
5. The variables were categorical.

COMPLIANCE WITH ETHICAL STANDARDS:

Permission to perform the study was granted by the University of the Witwatersrand Human Research Ethics Committee (medical) clearance certificate no. M200330. (Appendix B) Permission to conduct the study was also obtained from the office of the CEO of the respective hospitals (Appendix D, E, F) as well as the Department of Obstetrics and Gynaecology, the University of the Witwatersrand's academic head (Appendix C). Consent was inferred by answering the questionnaire. To maintain anonymity, no identifiers such as name or identity numbers were requested. Participants were allowed to exist the study at any given point. The questionnaires were self-administered, and the completed questionnaires were placed in a closed box to maintain anonymity of the participants.

CHAPTER 3: DATA ANALYSIS AND INTERPRETATION OF RESULTS

3.1 Introduction

The results analysed were from the 69 participants' responses received from the expected sample size of 288.

3.2 Demographical information of the participants

The median age of the participants was 35 years (IQR 32 -39.5). The categories of age (n=68) was eight (12%) in the < 30 year age group, 42 (62%) in the 30-39 year age group, and 18 (26%) in the > 40 year age group. The age range was 27-64 years. There were 41 (59%) female participants and 28 (41%) male participants. Sixty-seven participants answered the question regarding race, 53 (79%) were African, eight (12%) Caucasian, three (4%) were mixed race, and one (1%) was Indian. There were two (3%) that represented the other race not in the list. Category "other" on the questionnaire was not further explained by the participants.

There were 39 (57%) who were Registrars, 14 (21%) who were medical officers, and 15 (22%) who were consultants and one did not answer the question. Forty-four participants answered the question on their additional qualifications; 16 (23%) had diploma in Obstetrics and Gynaecology, nine (13%) did not have any additional qualifications, and 20 (29%) and another qualification (diploma in HIV Management, Anaesthesiology, Emergency Medical care; BSC in Biochemistry, Sport Science, Medical Science and Biokinetics; MSc in biochemistry; Subspecialty in Maternal and Foetal Medicine).

The mean level of experience of participants was 4.5 years (SD± 5.3). Twenty-nine participants answered the question on time in current post. There were 23 (79%) who have been working in their current posts < 5 years, four (14%) have been working on their current posts for 5 to 10 years while two (6%) have been working on their current post for >15 years.

3.3 Knowledge about the apparatus

Of the participants who answered the question on knowing the apparatus (n=68), 45 (66%) knew answered 'YES', while 23 (34%) answered 'NO'. See Figure 3.1.

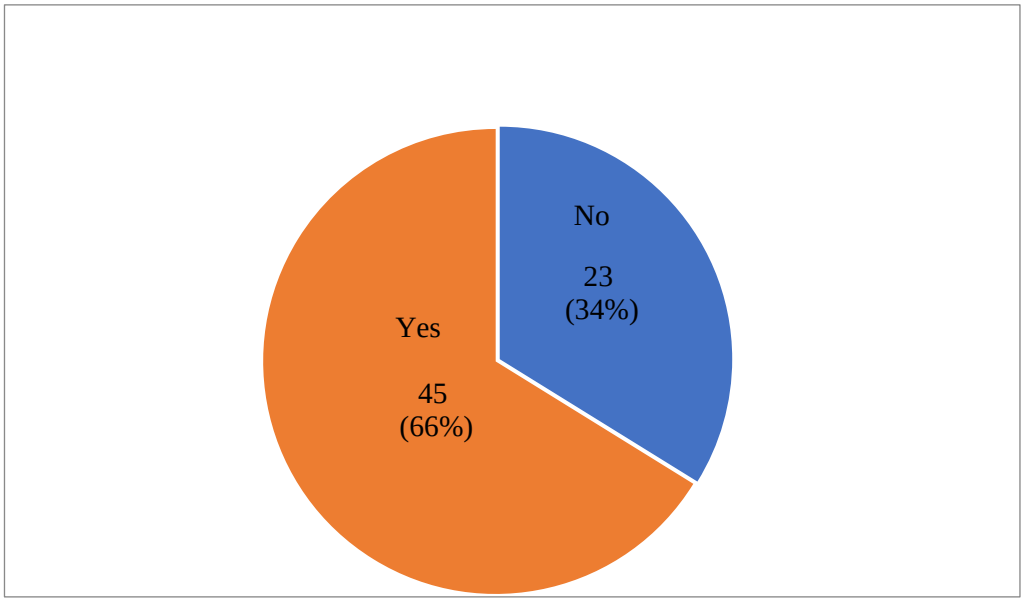


Figure 3.1: Medical practitioners' knowledge of the menstrual cup

However, from the 45 medical practitioners who had answered 'YES', five (7%) of them were found to be mistaken. It was found that three (4%) thought it was a device used for assisted delivery during prolonged second stage of labour or fetal distress, while two (3%) thought it was a contraceptive device. Of the 34 participants who answered 'NO', eight attempted to answer further questions on the apparatus in question. However, the answers to the questions regarding the device were incorrect from this group of participants.

3.4 How did they come to know about the menstrual cup

Fifty-three participants who responded to this question. Their answers are as follows, 17 (32%) have read about the menstrual cup, 16 (30%) have seen it before, while 10 (19%) have only heard about it. There was four (8%) who have read and heard about this apparatus and one (2%) have seen and heard about it before. This question was noted as "Not applicable" by five (9%). See Figure 3.2.

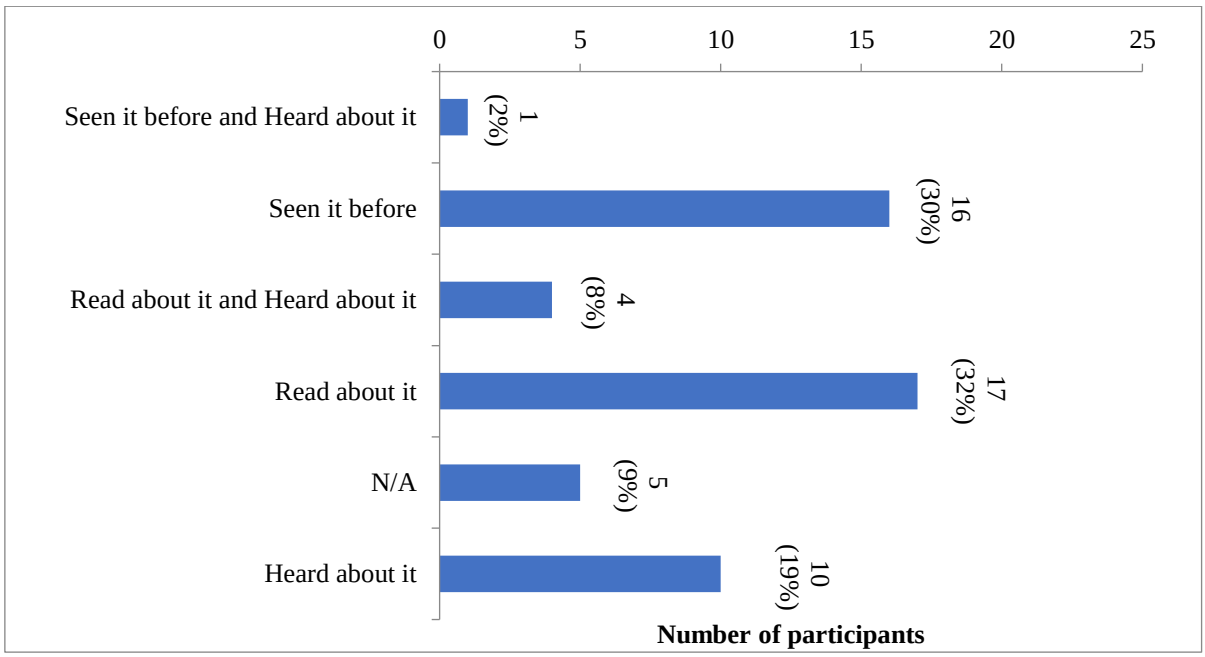


Figure 3.2: How participants came to know of menstrual cup

3.5 Estimation of the cost of the apparatus in South African Rand (ZAR)

Fifty-nine participants answered this question. The results are as follows; 28 (47%) thought it costs between R50 to R100, while 21 (36%) said it was between R250 to R500. There were 7 (12%) who said they did not know how much it costs and three (5%) who said the question does not apply to them. The cost of the apparatus in large pharmaceutical retailers in South African at the time of the data collection was between R250 and R500 with prices dependant on the location as well as the size of the retailer. Therefore, 28% of the participants' estimate was too low and none was estimated too high. The results also showed that 20% of female respondents' estimation was correct as opposed to 15% of male respondents.

3.6 Likelihood of recommending the usage of this apparatus to practitioners' patients

From the 50 participants who responded to this question, six (12%) of medical practitioners reported that they were highly likely to recommend the usage of this apparatus to their patients (with a score of 10), while seven (14%) were least likely to recommend it. There were 13 (26%) medical practitioners that were neutral about the recommendations (scores between 5 and 6). Eighteen (36%) of medical practitioners were likely to recommend the usage of the apparatus (scores between 7 and 9), while six (12%)

were somewhat likely to recommend it with scores between 2 and 4. This is represented in figure 3.4.

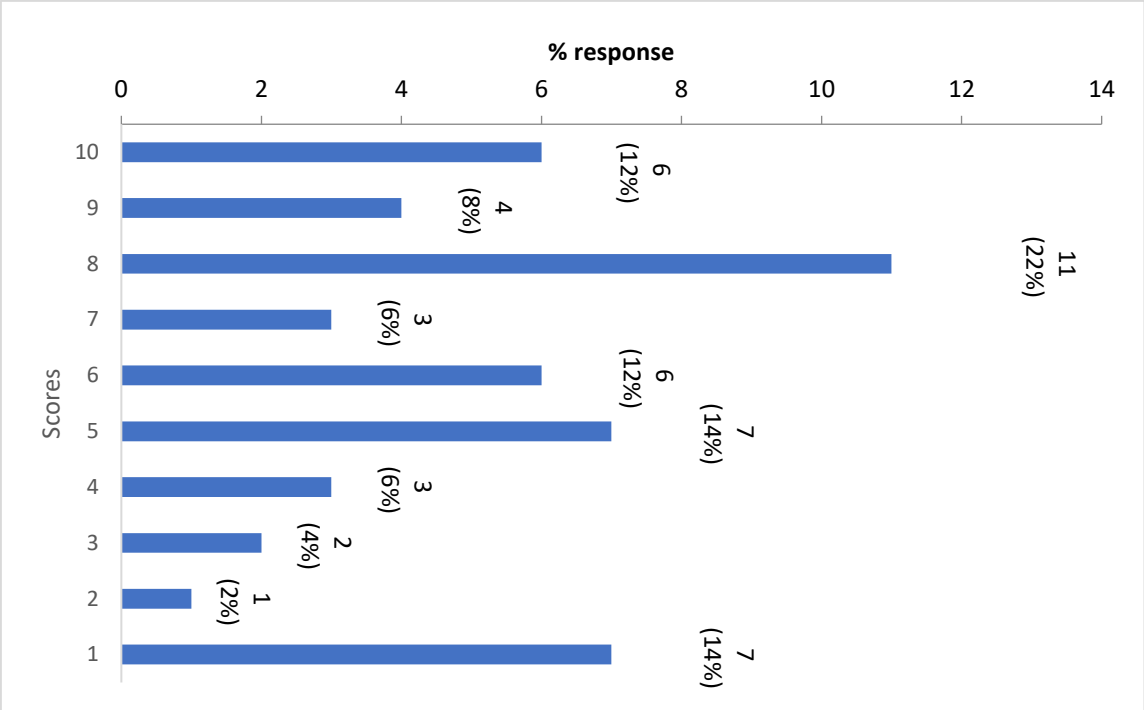


Figure 3.3: Likelihood of participants recommending menstrual cup

3.7 Reasons for the recommendation of menstrual cup

Table 3.1: Reasons for recommendation of menstrual cup

Category	Themes	Frequency count	Percent (%)
Highly likely to recommend	Cost effective	9	13%
	Convenient	4	6%
	Assistance with delivery of foetus	2	3%
	Safe to use	1	1%
	Promotes hygiene	1	1%
	Environmentally friendly	1	1%
	Easy to educate on use	1	1%
Neutral	Lack of experience amongst practitioners with product	3	4%
	Affordability	3	4%
	Acceptability (Lack of)	2	3%
	Hygiene practice	1	1%
Least recommended	Lack of knowledge amongst medical practitioners	4	6%
	Inconvenient	1	1%
	Impractical	1	1%
	Irritation	1	1%
	Lacks efficacy	1	1%

Results shows that there were nine participants who are highly likely to recommend this apparatus because it is cheap or cost effective, for example;

Respondent 21: "Cost effective, simple to use, easy to educate patient on use and hygiene".

Four participants said they are highly likely to recommend this apparatus because of its convenience for use, for example;

Respondent 6: "It is reusable therefore it is cost effective and convenient".

Respondent 47: "It seems like its user friendly".

One participant was highly likely to recommend this apparatus because it is simple to use, for example;

Respondent 21: "Cost effective, simple to use, easy to educate patient on use and hygiene".

One participant was highly likely to recommend this apparatus because it is safe, for example;

Respondent 60: "cost effective, safe if used correctly".

One participant was highly likely to recommend this apparatus because it is easy to educate patients, for example;

Respondent 21: "Cost effective, simple to use, easy to educate patient on use and hygiene".

One participant was highly likely to recommend this apparatus because it is environmentally friendly, for example;

Respondent 67: "Good for environment, cost effective".

One participant was highly likely to recommend this apparatus because of hygiene, for example;

Respondent 66: "Cost effective. Hygiene".

One participant was neutral about the recommendation of this apparatus because of cultural issues (acceptability), for example;

Respondent 23: "cultural breeds out issues".

One participant was neutral about the recommendation of this apparatus because it may not be acceptable, for example;

Respondent 1: "May not be acceptable to put".

One participant was neutral about the recommendation of this apparatus because they say it depends on affordability, for example;

Respondent 11: "It depends on the social background and affordability of sanitary pads".

Two participants were neutral about the recommendation of this apparatus because they don't know about it, for example;

Respondent 7: "I don't know about it, no experience with it, but open for trying new things".

Two participants were neutral about the recommendation of this apparatus because they have no experience with it, for example;

Respondent 25: "Limited experience with use".

One participant was neutral about the recommendation of this apparatus because of hygiene practices, for example;

Respondent 46: "Hygiene practice related".

Four of participants were least likely to recommend this apparatus because they don't know about it, for example;

Respondent 54: "Never used it myself and don't know much information about it".

Respondent 34: "Lack of knowledge/exposure"

One participant was least likely to recommend this apparatus because they say it causes irritation, for example;

Respondent 55: "It can cause irritation & removing it can be messy".

One participant was least likely to recommend this apparatus because of inconvenience, for example;

Respondent 56: "Tedious process of insertion for a limited usage time".

One participant was least likely to recommend this apparatus because they say it is less effective, for example;

Respondent 29: "less effective".

One participant was least likely to recommend this apparatus because they are not sure of evidence of its usage, for example;

Respondent 34: "Not sure of evidence of the use".

One participant was least likely to recommend this apparatus because of lack of hygiene, for example;

Respondent 27: "Unhygienic in a SA population, where do you clean. Impractical".

3.8 Estimation of how long the menstrual cup can be reused

Fifty-eight participants answered this question. The responses are summarised in Figure 3.4.

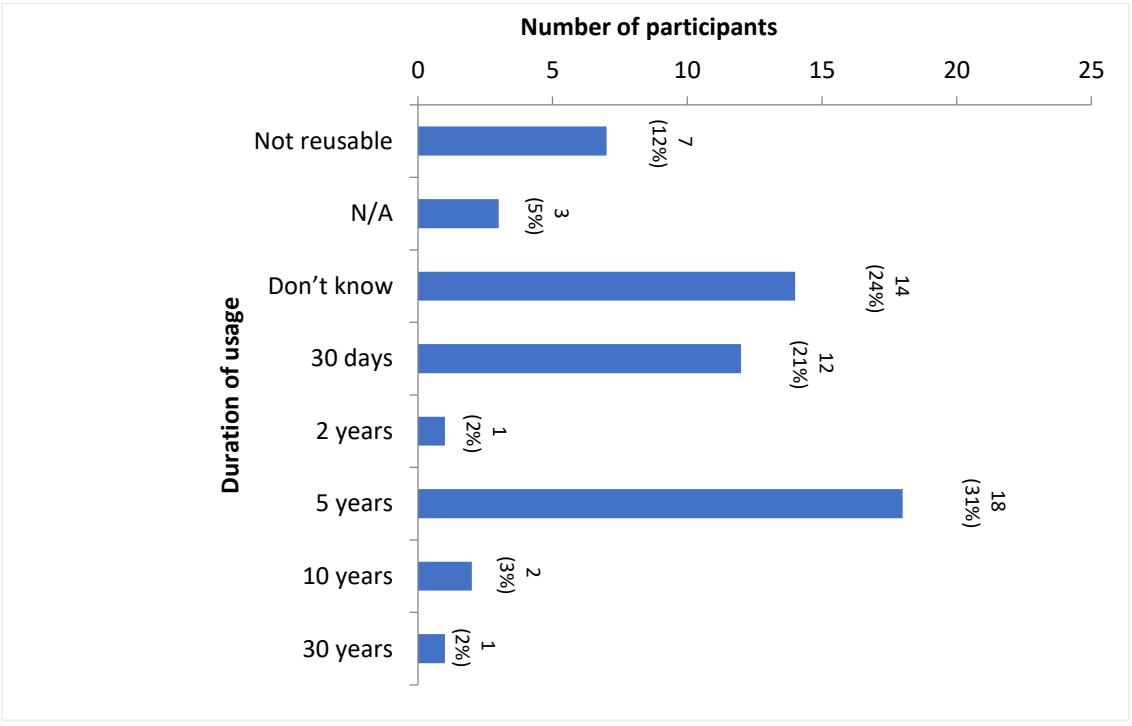


Figure 3.4: Responses on duration of usage of the menstrual cup

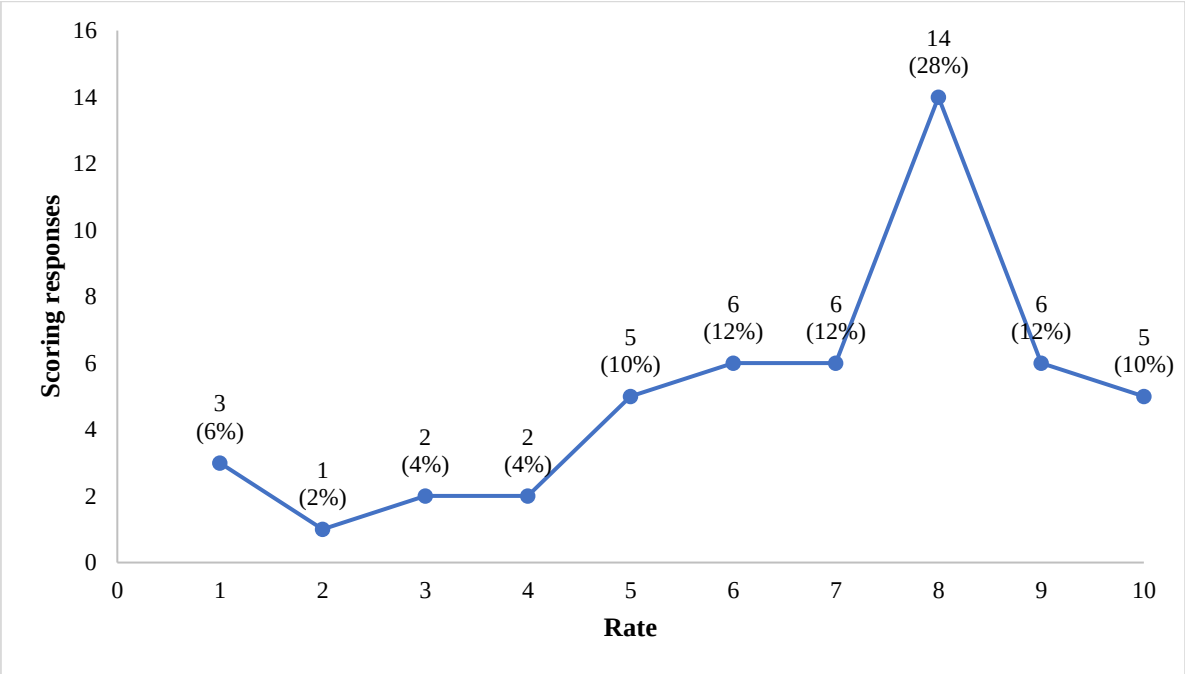


Figure 3.5: Device safety scoring

Only 50 participants rated the safety of the device. The results are depicted in Figure 3.5. They are as follows, five (10%) of participants rated it 10/10. Six (12%) participants rated the device 9/10 safe. Fourteen (28%) participants rated it 8/10, six (12%) rated the device 7/10, and 6/10 safe by another six (12%) participants. There were five (10%) participants that rated the safety score as 5/10, two (4%) rated it 4/10, and two (4%) rated it 3/10. Only one (2%) rated it 2/10 and three (6%) rated it 1/10.

3.9 Age profile of participants who had knowledge of the menstrual cup in Department of Obstetrics and Gynaecology

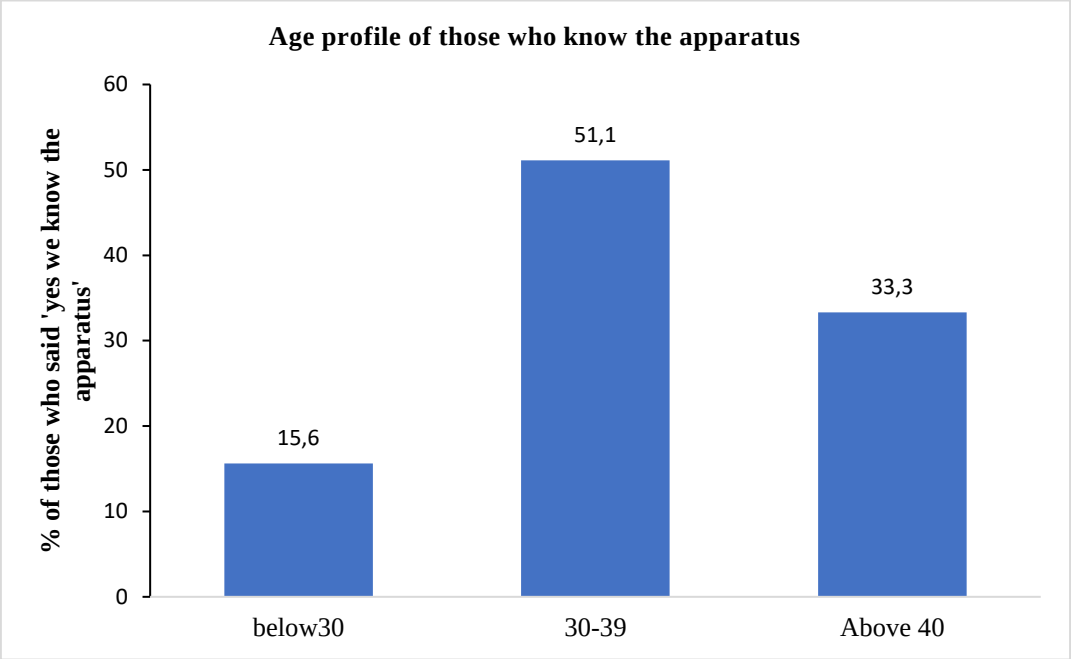


Figure 3.6: Age profile of participants who had knowledge of menstrual cup

Figure 3.6 depicts the age distribution of those who had knowledge of the menstrual cup. There was no statistically significant difference in the knowledge amongst the different age groups (p-value = 0.052).

With regards to gender, 31 (69%) female participants knew the menstrual cup, while 13 (31%) male participants knew the cup. There is an association between the gender of the medical practitioner and knowledge of the apparatus (p-value =0.043). Figure 3.7 depicts the racial profile of the participants who knew the menstrual cup. It also reflects the racial distribution of medical practitioners in the Department of Obstetrics and Gynaecology, the University of the Witwatersrand. There was no statistically significant difference in knowledge and race of the participants.

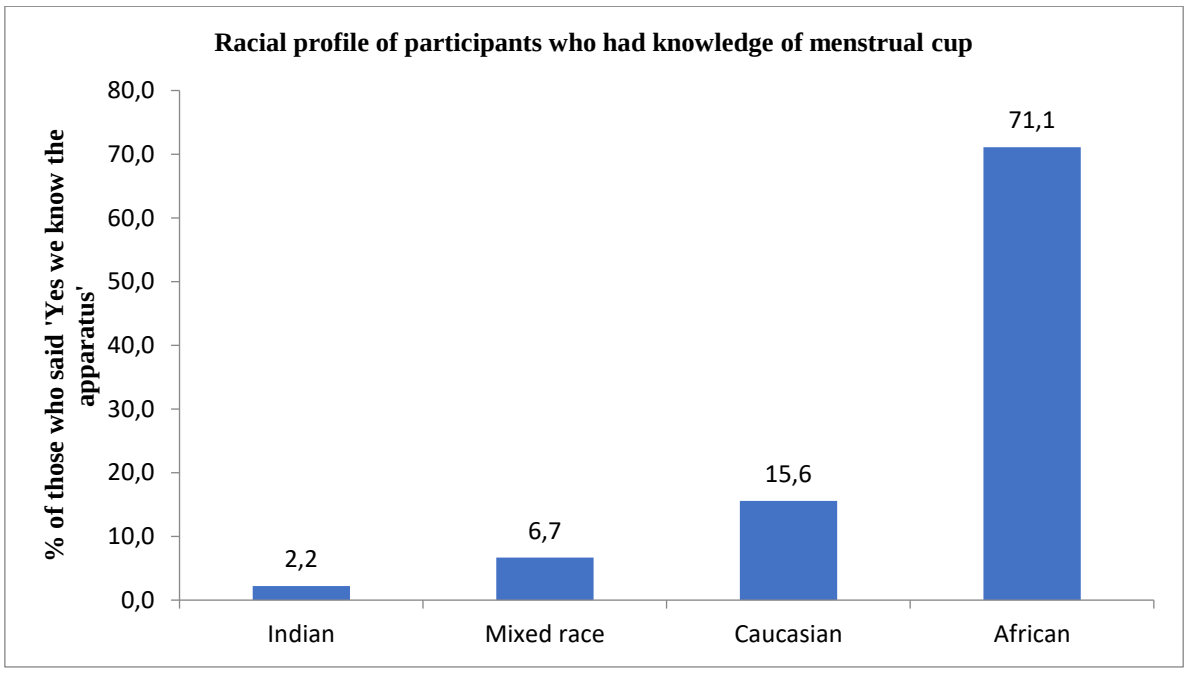


Figure 3.7: Racial profile of the participants who had knowledge of menstrual cup

3.10 Professional level of participants who had knowledge of the menstrual cup in medical practitioners in Department of Obstetrics and Gynaecology.

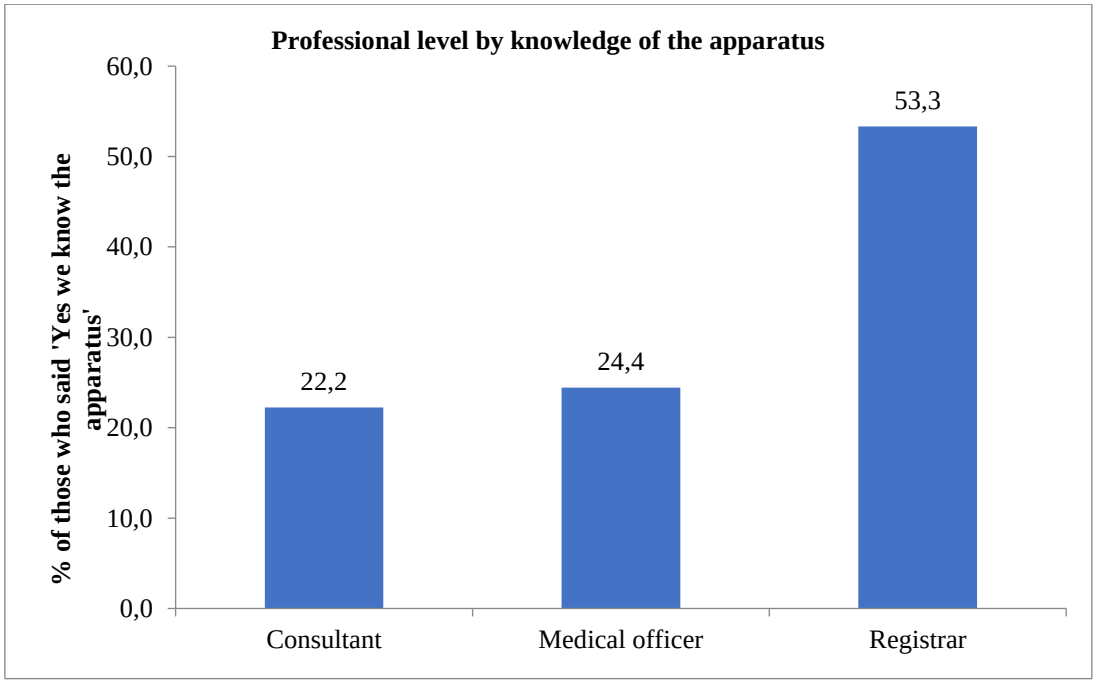


Figure 3.8: Professional level of the participants who had knowledge of menstrual cup

The highest percentage of medical practitioners in the study were registrars. Figure 3.8 depicts the professional level of the participants who knew the menstrual cup.

There was no association found between the professional level of the medical practitioner and knowledge of the menstrual cup.

3.11 Years in current post level by knowledge of the menstrual cup in medical practitioners in Department of Obstetrics and Gynaecology

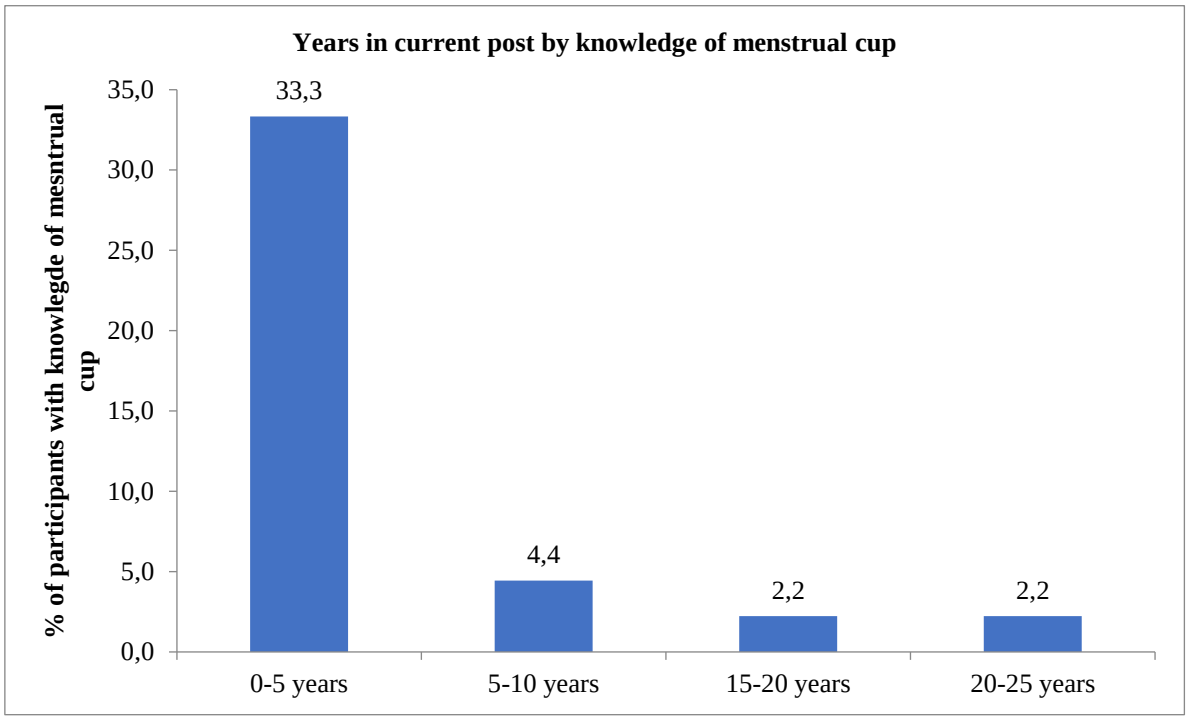


Figure 3.9: Years in current post of participants who had knowledge of the menstrual cup

Figure 3.9 summarises the years in current post of the participants who had knowledge of the menstrual cup. Twenty-six (59%) of participants who knew the menstrual cup did not reveal their years in current posts. There was no statistically significant association between years in current post of the medical practitioner and knowledge of the menstrual cup.

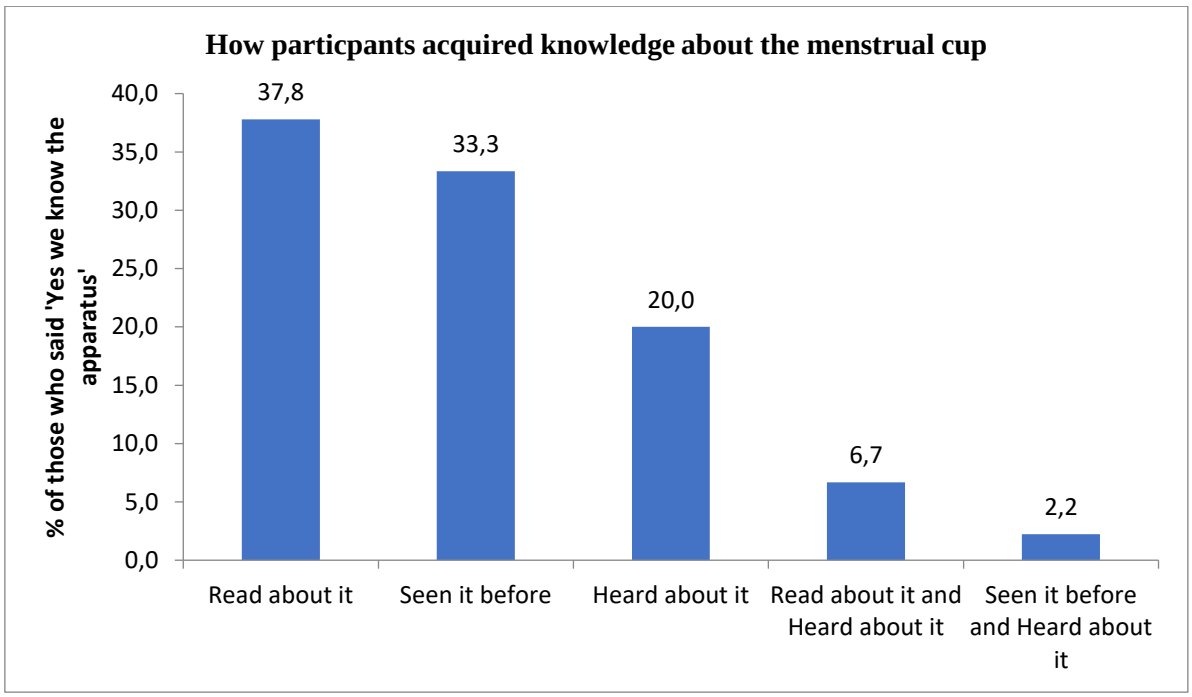


Figure 3.10: How participants acquired knowledge about menstrual cup

Figure 3.10 shows the results of how the participants had acquired knowledge of the menstrual cup. Majority of medical practitioners (38%) who knew about the menstrual cup had acquired the knowledge by reading about it. There was an association between knowledge of the menstrual apparatus by how participants saw, heard, or read about it (p-value=0,000001).

3.12 Which complications do you anticipate from its usage?

Table 3.2: Complications anticipated with the use of menstrual cup

Category	Themes	Frequency count	Percentage
Complications	Infections	33	48%
	Discomfort	8	12%
	Leakage	7	10%
	Traumatic injury	5	7%
	Irritation of tissues	4	6%
	Displacement	4	6%
	Toxic Shock Syndrome	3	4%
	Incorrect usage	2	3%
	Poor sanitation or cleaning	2	3%
	Atrophy	1	1%
	Difficult insertion	1	1%
	Pressure symptoms	1	1%
	Fistula formation	1	1%
	Subdural/ intracranial haemorrhage	1	1%
	Unplanned pregnancy	2	3%
	Dyspareunia	1	1%

Table 3.2 lists the presumed complications. Thirty-three (48%) said that infection could be a complication if the cup was not properly cleaned or replaced. The types of infections mentioned were endometritis, vaginal discharge, vaginitis, and sepsis. Another reason cited as a cause for infection was prolonged use of the cup without emptying its' contents. Discomfort with the usage of the menstrual cup was anticipated as a complication by eight (12%) participants. Seven (10%) participants said that leakage of menstrual fluid could be a complication. The traumatic injury was thought to be a complication by five (7%) participants. Four (6%) participants thought that displacement of the menstrual cup would be a complication.

Toxic shock syndrome was indicated by three (4%) of participants. Other participants indicated that the complications anticipated were atrophy, pressure symptoms, fistula formation, and difficulty of insertion. There were also some unexpected complications cited by participants that were unrelated to the menstrual cup, such as subdural/ intracranial haemorrhage, perineal tears and dyspareunia. These responses were given by the respondents who thought this was an instrument used to perform assisted deliveries and as a contraceptive device.

CHAPTER 4: DISCUSSION

Studies have shown that even though the menstrual cup may be unknown to many females, once it is introduced to them, it is an acceptable alternative to disposable products especially in resource-poor countries (7, 11). In our study, we found that there was a lack of acceptance by those who knew about it, and the prospects for discussing and encouraging patients to use it were minimal. However, the literature we have reviewed shows that if this product is expanded to the communities and they are taught about the menstrual cup, we are likely to see an increase in acceptance of use in the communities (7, 8, 11, 26, and 36). Minimal literature was found that investigated the knowledge of the menstrual cup amongst medical practitioners as well as whether the practitioners advocate for menstrual cup usage to their patients and the community at large. In this study, we have explored one of the reasons why the menstrual cup (which seems to be a solution for many females) may not be widely known throughout the community. We had suspected that it may have to do with the fact that the medical practitioners themselves have little to no knowledge of the menstrual cup, therefore are unable to advise their female patients on this product and its usage.

The number of medical practitioners that knew about the menstrual cup in our study was low. However, it is expected as menstrual hygiene management is not taught to students or medical practitioners. The findings were found to be similar to a study from Pakistan where 57.6% of healthcare workers were unaware of the product too (39). We had anticipated that since the medical practitioners were working within the Department of Obstetrics and Gynaecology in an academic setting (specialising in female reproductive health), would have had better knowledge regarding this product. In contrast, a study from India by Divakar et al., conducted on 163 Obstetricians and Gynaecologists, showed knowledge of the product in 93% of their participants (38). The findings were significantly different from ours. It cannot be explained why there are such disparities in the findings between the three studies. India, Pakistan and South Africa are all classified as LMICs, but perhaps they may be a difference in the teaching of MHM or the marketing of the product in the three countries.

There was a misconception among 7% of the participants who had said that they knew the menstrual cup. There were 4% of the participants who thought that the could be used for

assistance in the delivery of a baby, while 3% thought it was a contraceptive device. Therefore, only 58% of participants showed knowledge of the menstrual cup. The misconception that the cup is a contraceptive device was similar to that seen in a study by Eti et al., where they found that 5.3% of participants thought it was a contraceptive device (40). However, their study population consisted of medical students, therefore the participants' misjudgement can be expected as they are still in their undergraduate training. It is also possible that perhaps in both studies participants had been mistaken due to the type of menstrual cup that was displayed. In 2019, there were approximately 199 brands of menstrual cups manufactured worldwide (28). Menstrual cups come in different colours, shapes, and sizes, while others are enclosed within a container or bag.

We assessed the demographics of the study population in relation to the knowledge regarding the menstrual cup. It was expected that the female participants would have more knowledge regarding the product as it could be something that may have been presented to them as a form of MHM. In addition to that, most of the study population consisted of females as compared to males, therefore these findings need to be interpreted with caution. A study performed in an Indian university on 400 female medical students, showed that 99% of them had knowledge of the menstrual cup (40), which is significantly higher than what we found in our study. Perhaps the medical students in India get taught about MHM products as part of their training or it could be that this type of MHM is widely used by the Indian population. Their findings were also in keeping with the study by Divakar et al. that was also conducted in India.

The majority of the participants who knew the menstrual cup were between the ages of 30 and 39 years. This finding is to be expected given that most participants were currently training as registrars. Taking into consideration the medical training schedule in South Africa, this subset of participants is likely to be in that age range. Therefore, these findings too need to be interpreted with caution. We however did not find any association between the age of participants and their knowledge of the device. Despite the long history of the menstrual cup (37), but we couldn't find any literature that indicates when the cup was first introduced in South Africa. We found that the MPower MCup was the first initiative to produce menstrual cups locally in Cape Town. The company was only founded in 2008 (25). We are therefore unable to draw any conclusions regarding why the age of participants was not related to knowledge of the device.

The study participants consisted of registrars, medical officers and specialist consultants. We did not find any association between professional level of the medical practitioner and their knowledge of the menstrual cup. The findings were unexpected. We had expected that the senior practitioners would have had more knowledge of the device compared to the junior practitioners. The lack of knowledge across all levels in our study may signify the lack of exposure to the menstrual cup in South Africa. We also did not find any association between the level of experience in terms of years and the knowledge of the menstrual cup. However, this may be explained by the fact that most of the practitioners had only been in their current post for less than 5 years. Furthermore, 59% of the respondents who knew the menstrual cup did not answer the question regarding the number of years that they have spent in their current post. Therefore, our results may be inaccurate with regard to our study population.

Because our study was conducted within academic institutions, it was expected that those that knew of the menstrual cup had acquired the knowledge through reading. The majority of the participants said that they had come to know about the device from having read about it. There was an association between knowledge of the menstrual apparatus by how the participants had acquired the knowledge, (p-value = 0.000001). Therefore, to increase knowledge of the device amongst medical practitioners, efforts need to be made to teach them. Perhaps awareness campaigns should not only be directed towards patients.

Another barrier to knowledge and recommendation that may exist in medical practitioners is the cultural backgrounds that they may have as well as the misconceptions regarding menstruation taught to them by their parents. In some cultures, women are ostracized during menstruation, restricted from attending religious gatherings or even in the preparation of food for the family. A study performed in Karachi; Pakistan found that healthcare workers are harbouring misconceptions with regard to menstruation. In 53.1 % of practitioners, the main source of information about menstruation at the time of menarche was their mothers. Certain practices, such as avoidance of bathing during menses were practiced by 48% of health practitioners (39). Social factors and norms can influence a person's attitude as well as behaviour. Our study did not explore cultural factors in our participants that may deter them from encouraging the usage of the menstrual cup.

Our study showed that there was no association between the race of the participants and knowledge of the menstrual cup. In the South African setting, the injustices that had occurred in the past have led to social inequity amongst different racial groups in the present day. In the general population, we would expect that those of lower social standing would have more

knowledge regarding the menstrual cup as it is generally promoted in resource-poor settings to females who are unable to afford disposable sanitary products. However, the inequalities are thought to have been levelled out through education which leads to the social and economic advancement of the members of the different groups. Our study population has gone through a similar tertiary education system and is likely to be of similar social standing. In addition, the lack of knowledge regarding menstrual cups across all boards may be indicative of the paucity of information around the subject matter, irrespective of the racial background that which one belongs.

The Mina Cup that is available in South Africa is reusable for up to 5 years, depending on the user's capability to care for the cup (25). There are various brands manufactured in several countries, with durations of usage ranging from 5 to 10 years. However, the lifespan is typically 5 years (11). Some brands that are available in large pharmaceutical retailers in South Africa are marketed for use in three menstrual cycles only. There were less than a third of participants who were correct in saying that the device could be reused for 5 years and the remainder were incorrect with answers ranging from not knowing and not reusable. It is most likely that the participants did not know the duration of usage of the device. But perhaps the differences in answers seen may be due to the participants having been exposed to the different brands marketed in the retail stores.

The menstrual cup in South Africa currently retails at ZAR250 to ZAR500. Costs may vary depending on the manufacturing company, country of origin, duration of usage, or the retail store in which it is sold. Given the duration of usage of the menstrual cup, the cost savings are quite significant. In South Africa, the cost of disposable sanitary products is nine times higher than the cost of menstrual cups. Many studies have piloted the menstrual cup in LMIC due to the potential cost savings (7,11). The majority of participants thought that it costs between ZAR50 to ZAR100, which is 40% less than the expected price. Knowledge regarding the cost of a certain device would be important if one had to recommend it to patients, to advise them appropriately.

Infection was thought to be the most common complication of menstrual cup usage. Many anticipated that it would be a factor due to improper cleaning or if the device is not replaced. Lack of WASH facilities is concerning, and vaginal intrusion may be a problem and could lead to infections, however, the studies we looked at don't support this (3, 7, 17). A study in Kenya reported lower rates of bacterial vaginosis in menstrual cup users as opposed to sanitary pad

users. (17). in another study by Juma et al., it was found that a third of cups used showed a growth of *E. Coli*. However, the greatest proportion was amongst the new users, therefore it was attributed to contamination (43). Menstrual cup use does not affect vaginal microorganisms (3), but it may be possible that pre-existing sexually transmitted infections may be propagated by the usage of the menstrual cup (29).

With regards to TSS, the possibility still exists that it may develop in menstrual cup users. The reported risk was found in five cases out of 3319 participants (7), which is low. The theory is that menstrual fluid collecting within the cup provides a growth medium for *S. Aureus* (32). Only a few of our study participants thought that this could be a possible complication. The low percentage could show that participants actually did know that the chance of this complication occurring was low and was therefore not worth mentioning. However, we did not ask this question specifically, perhaps the percentage would have been higher.

It is reassuring that only a few listed discomfort as one of the complications, this is often a misconception. A South African study by Beksinska et al. conducted on 110 women, compared the acceptability and performance of the menstrual cup with that of tampons and sanitary pads. The menstrual cups were rated better in terms of comfort and quality of products and performance of product overall (11). Similar results were obtained in another study by Howard et al., where the overall satisfaction was higher in the menstrual cup group as opposed to the tampon group. Subjective vaginal discomfort was however higher in the cup group initially but was decreased with continued use of the cup (17). Another complication mentioned by 10% of our study's participants was menstrual fluid leakage. However, studies have shown that menstrual cup leakage was lower or similar to those of the usual disposal of menstrual products (3,11). From the study that we have reviewed, discomfort can improve over a familiarisation phase. It can be a part of the learning curve and it usually improves with usage (3,7,27,44).

Other complications mentioned were traumatic injury, irritation of tissues, and atrophy. In a study by North et al., it was found that from the 44 women who took part in the study, there were no alterations in the cervical or vaginal epithelium that could be found on colposcopy and cytology, after three successive menstrual cycles with the usage of the menstrual cup (3). Other complications that may occur are a result of the poor hygiene practices that menstrual cup users may have. Due to a lack of WASH facilities, there may be poor hand hygiene, failure to wash the cup after emptying, or failure to sterilize the cup at end of each cycle (7). These concerns

were raised by some of the participants who thought that poor hygiene would be a complication, while others thought that incorrect usage would be a potential complication. It was however not further elaborated on what the incorrect usage entailed. The real concern would be the possibility of sharing of the menstrual cup among different users. This can be reduced or prevented through adequate education of the users (44).

When the participants were asked if they would recommend the menstrual cup to their patients for usage, only 12% said they were highly likely to recommend the device. Reasons given were cost-effectiveness of the product, safety, and convenience of use, promotion of hygiene, as well as it being environmentally friendly. Even though the recommendation rate was low, most participants (90%) thought that the device was safe for usage. This indicates that there may be other reasons that were not explored by the study, that prevent the practitioners from recommending usage. Likewise, in a study by Eti et al., 92.4% of medical students thought that the device was safe for usage (40). In a study by Divakar et al., 93% of medical practitioners thought that the cup was more environmentally friendly than sanitary pads, however only 59% of them thought it was a better MHM product (38).

Expansion of the menstrual cup distribution and sales into communities may be limited by the resistance or lack of acceptability among medical practitioners. Health practitioners are not keen on discussing it. A cross-sectional study from India showed that 75% of practitioners discussed the product during health talks but, a meagre 17% discussed it in their consultation rooms. It was also found that only a mere 59% of practitioners thought it was appropriate to advice young girls to use the menstrual cup. Of that 59%, only 35% have proactively presented the menstrual cup as an alternative to other MHM products (38). These findings are like those in our study. In our study, we found that the reason for the minimal recommendation of usage was due to the lack of knowledge that the practitioners themselves had around the subject matter. Others generally found it unacceptable for use and thought that it was inconvenient for usage. Even the group of participants who were neutral regarding recommendations stated that they lacked knowledge regarding the cup.

CHAPTER 5: CONCLUSION

Medical practitioners are trusted throughout the communities to be advocates for the health of all. Advocating for something is linked to the knowledge and confidence that one would have in the subject matter, to be able to promote it adequately. The medical practitioners in our study had limited knowledge of the menstrual cup and are unlikely to recommend usage to their patients due to unfamiliarity with the device. Attempts need to be made to promote MHM teaching within the medical profession to promote menstrual health hygiene alternatives and the advancement of women in their reproductive ages. A medical practitioner in the Department of Obstetrics and Gynaecology should be able to define what is meant by adequate MHM and the barriers that prevent women from achieving it.

CHAPTER 6: RECOMMENDATIONS

- We recommend that menstrual hygiene management, including the use of menstrual cups, should perhaps be made part of the curriculum in the training of medical practitioners. It is a topic that is often forgotten and overlooked but has such large implications when it is mismanaged.
- We recommend that medical practitioners discuss menstrual hygiene management options with their patients and to make the talk part of consultations with female patients.
- Menstruation needs to be destigmatised through open discussions, and talks by both healthcare workers and members of the community.

CHAPTER 7: STUDY STRENGTH AND LIMITATIONS

Strengths:

- The study conducted was the first of its kind and can therefore be used as a reference for other studies in the future.
- The study has highlighted the need for further intervention or design of programs on this topic.

Limitations:

- The study population was smaller than anticipated due to poor recruitment.
- The study was conducted on a small subset of medical practitioners in the Department of Obstetrics and Gynaecology, the University of the Witwatersrand. Therefore, the information obtained cannot be generalised to all medical practitioners outside of this department or other facilities.
- Due to Covid-19 restrictions, the study could not be conducted at the academic meetings since they were being conducted online. Instead, participants had to be found performing clinical duties or at handover meetings. This may have led to bias in the study.

CHAPTER 8: REFERENCES

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APPENDIX A: QUESTIONNAIRE

This questionnaire is part of an MMed research study, investigating the knowledge of the apparatus displayed among medical practitioners in Obstetrics and Gynaecology (Wits). Please do not attach your name to this questionnaire.

Participation is this study is voluntary. The participant may withdraw from the study at any given time or may choose to not answer specific questions. No penalties will be incurred.

Any data that may be generated from this study may be used in the researcher's publication regarding this topic. (35).



Figure 1

1. What is your current age in years?

2. Gender: (please tick applicable)

Female	Male	Other

3. Ethnicity: (Please tick applicable)

African	Caucasian	Asian	Mixed race	Other

4. Professional level: (Please tick applicable)

Current post	Years on current post
a. Medical officer	
b. Registrar	
c. Consultant	
d. Intern	

Additional qualifications (E.g. Sub-speciality, Diplomas, Degrees), please specify below.

……
……
……
……

5. Do you know what the apparatus displayed in figure 1 is?

YES	**NO**

6. How did you come to know about this apparatus? (Please tick one box)

a. Read about it	
b. Seen it before	
c. Heard about it	

7. On a scale of 1-10, with 1 being the least likely and 10 being highly likely: Would you recommend the usage of this apparatus in your patients?

1	2	3	4	5	6	7	8	9	10
Reasons for your answer									

8. On a scale of 1-10, with 1 being the least likely and 10 being highly likely: How safe do you think this apparatus is?

1	2	3	4	5	6	7	8	9	10

9. How long do you think the apparatus can be re-used for? (Please tick one box)

a. Not reusable	
b. 30 days	
c. 5 years	
d. 10 years	
e. Don’t know	

10. How much do you think this apparatus costs in Rand? (Please tick one box)

a. Between R50 - R100	
b. Between R250 - R500	
c. Between R1000 - R1500	
d. Don’t know	

11. Which complications do you anticipate from its usage?

……
……
……

APPENDIX B: ETHICS CLEARANCE CERTIFCATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Dr Sekedi Yvette Chuene

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M200330

NAME: (Principal Investigator)	Dr Sekedi Yvette Chuene
DEPARTMENT:	Obstetrics and Gynaecology Chris Hani Baragwanath Academic Hospital, Charlotte Maxeke Johannesburg Academic Hospital and Rahima Moosa Mother and Child Hospital
PROJECT TITLE:	Knowledge and acceptability of the menstrual cup among medical practitioners working in obstetrics and gynaecology department
DATE CONSIDERED:	27/03/2020
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr Langanani Mbodi and Dr Vusumuzi David Maringa
APPROVED BY:	CB Penny Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	20/08/2020

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions.Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report.** The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **March** and will therefore be due in the month of **March** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX C: LETTER OF PERMISSION TO CONDUCT RESEARCH FROM ACADEMIC HEAD OF DEPARTMENT

9th March 2020

Dr. Sekedi Yvette Chuene

Student number: 363313

Dear Dr Chuene

Re.: Request to conduct research in the Department of Obstetrics and Gynaecology, University of the Witwatersrand

I hereby give Dr. Chuene permission to conduct her project: Knowledge and Acceptability of The Menstrual Cup Among Medical Practitioners Working In Obstetrics and Gynaecology Department.

This is after the study is granted permission by the relevant Research Ethics Committee.

Regards



Prof Hennie Lombaard

Head of Department Obstetrics and Gynecology

Rahima Moosa Mother and Child Hospital

Adj. Professor Department Of Obstetrics and Gynecology, University of Witwatersrand.

APPENDIX D: LETTER OF PERMISSION TO CONDUCT RESEARCH FROM CEO CMJAH

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL

Enquiries:
Ms. N. Mzila
Office of the Clinical Director
Email: Nolwazi.Mzila@gauteng.gov.za
Tell: (011): 488-4812
03 March 2020

Dear Dr. S. Y. Chuene

STUDY TITLE: Knowledge and Acceptability of the Menstrual Cup among Medical Practitioners Working In Obstetrics and Gynaecology Department (Wits).

Permission to review patient file for conduction of the above mentioned study is provisional approved. Your study can only commence once Ethics approval is obtained. Please forward a copy of your Ethics Clearance Certificate as soon as the study is approved by the Ethics Committee for the CEO's office to give you the final approval to conduct the study.

Supported / not supported

Dr. P. Africa
Acting - Clinical Director
DATE: 03/03/2020

Approved / not approved

Ms G. Bogoshi
Chief Executive Officer
DATE: 05.03.2020

APPENDIX E: LETTER OF PERMISSION TO CONDUCT RESEARCH FROM CEO RMMCH

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

RAHIMA MOOSA MOTHER AND CHILD HOSPITAL

Enquiries : Karen Marshall
Tel : (011) 470 9284
Fax : 086 553 4623
Email : Karen.Marshall@wits.ac.za

TITLE OF RESEARCH PROJECT:
"KNOWLEDGE AND ACCEPTIBILITY OF THE MENSTRUAL CUP AMONG MEDICAL PRACTITIONERS WORKING IN OBSTETRICS AND GYNAECOLOGY DEPARTMENT"

NAME OF RESEARCHER:
Dr SY Chuene
Department of Obstetrics and Gynaecology
University of the Witwatersrand

NHRD REF NO: GP_202005_003

Dear Dr Chuene,

Permission is granted for you to conduct the research as indicated in the title above.

The terms under which this permission is granted is contained in the Researcher Declaration form that you have signed. Failure to comply with these conditions will result in the withdrawal of such permission.

It is crucial for you to inform the Research Coordinator, Karen Marshall of the actual start and end dates of your study. This could be done by e-mail.

Should the study commence more than 12 months after receipt of this approval letter you will have to go through the process of applying again.

You are strongly advised to keep a signed copy of the declaration form so as to ensure that the terms of this agreement are complied with at all times.

Yours sincerely,

DR FREW BENSON
ACTING CHIEF EXECUTIVE OFFICER
2020:05:08

ADDRESS: Cnr. FUEL & OUDSTHOORN STREET CORONATIONVILLE 2093 / PRIVATE BAG X20 NEWCLARE 2112 JHB

APPENDIX F: LETTER OF PERMISSION TO CONDUCT RESEARCH FROM CEO CHBAH

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

MEDICAL ADVISORY COMMITTEE

CHRIS HANI BARAGWANATH ACADEMIC HOSPITAL

PERMISSION TO CONDUCT RESEARCH

Date: 25th March 2020

TITLE OF PROJECT:

Knowledge and acceptability of the menstrual cup among medical practitioners working in Obstetrics and Gynaecology.

UNIVERSITY: Witwatersrand

Principal Investigator: Sekedi Yvette Chuene

Department: Obstetrics and Gynaecology

Supervisor : Dr VD Maringa

Permission Head Department (where research conducted): N/A

The Medical Advisory Committee recommends that the said research be conducted at Chris Hani Baragwanath Academic Hospital. The CEO / management of Chris Hani Baragwanath Academic Hospital is accordingly informed and the study is subject to:-

- **Permission having been granted by the Committee for Research on Human Subjects of the University of Witwatersrand.**
- The Hospital will not incur extra costs as a result of the research being conducted on its patients within the hospital
- The MAC will be informed of any serious adverse events as soon as they occur
- Permission is granted for the duration of the Ethics Committee Approval.

.....
Recommended
(On behalf of the MAC)
Date: 25/03/2020

.....
Approved/Not Approved
Hospital Management
Date: 26/03/2020

APPENDIX G: IMAGES OF MENSTRUAL CUP



Figure A1: menstrual cup inside the casing



Figure A2: menstrual cup outside casing

APPENDIX H: TURNITIN REPORT

_Menstrual cup MMed_Final2 turnitin-1.docx

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