



# Menstrual Cup: A Review Entailing the Parameters Influencing its Usage

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## Abstract

Menstrual cups have been in the market for several decades now, however, the prevalent use of the product has not seen a sharp rise amongst the users. Menstrual cups serve the manifold purpose in its use as a menstrual hygiene product as well as a technology that helps mitigate the pollution produced by the present and conventional forms of menstrual hygiene products like the sanitary pads and tampons being the most used, whereas cotton cloths in rural areas of many developing and underdeveloped countries are not missed. The purpose of this research is to understand the psychology of women of the menstruating population toward the use of a rather cheap, environment friendly and backed by gynecologists' product. Additionally, to understand the behavior and experiences of women who have tried and tested the product and can provide a comprehensive note on the usage of menstrual cups in comparison to pads and tampons.

**Keywords:** Menstrual cups; Sanitary pads; Tampons

## Introduction

The inception of menstruum is undoubtedly the most vibrant transformations transpiring in each woman during puberty. Menarche is a psychosocial and behavioral switch apart from a physiological change. Menstrual hygiene includes essentialities and requirements inclusive of but not limited to the utilization of absorbents like sanitary pads, tampons and menstrual cups, satisfactory cleansing of the genitals, suitable dumping of utilized absorbents, and other healthcare needs of females during the menstrual cycle. For the Period Of menstruum, practicing good hygiene is very critical which precludes from undesirable health consequences. Though menstruation is a natural bodily activity, it is nevertheless enveloped with societal prohibitions, fallacies, and mismanagements, which is incredibly difficult for menstruating girls in emerging nations. Owing to these societal anastigmatic, ethnic, and holy restraints, catamenial procedures are deemed as a massive constraint for managing catamenial hygiene [1].

Owing to this, our research highlights the alternative to make use of menstrual cups as a fluid collection device instead of an absorbent device. Still struggling to gain mass popularity, menstrual cups are undeniably an eco-friendly and much cheaper option than pads or tampons.

This research underscores the parameters which affect the usage of cups as a fluid collection device and focuses on behavioral psychology of women who have used the product.

A menstrual cup is a not so recent technology used in Menstrual Hygiene Management. It is customarily built up of medical grade silicone, rubber, latex, or elastomer and can last up to 10 years. Disposable single use menstrual cups are also available in the market. Various parameters like safety, quality, cost, availability, and ease of using separate menstrual cups from other conventional products for menstruation in the market.

## Menstrual Hygiene Management

Menstrual hygiene management is defined as the management of hygiene with respect to the menstrual process.

Menstrual hygiene materials are the items which are used to retain or gather menstrual flow, such as pads, cloths, tampons or cups.

Menstrual necessities are additional strong things needed for MHH, such as body and washing soap, underclothing and pain relief medications.

Menstrual amenities are those amenities most connected with secure and dignified menstruum, such as toilets and water supply etc.

Menstrual hygiene management is about admittance to catamenial hygiene products, to soak up or accumulate blood, the secrecy to change the materials and also to get the amenities to throw off worn catamenial management materials. Menstrual hygiene management can be exceptionally tough to the females of the emerging nations where clean water and toilet facilities are consistently inadequate. Menstrual waste generally is neglected in institutions in emerging nations, notwithstanding it is a critical issue. Menstruum can be an obstruction to learning for numerous females, due to the absence of efficient sanitary supplies impedes girl's engagement in schooling and societal activities.

## Importance of Menstrual Hygiene Management

Menstrual hygiene management is hygiene associated with menstruation and usage of menstrual products. It includes all the menstrual facilities and the supplies of the menstruation cycle. Menstrual hygiene management has a direct correlation with various factors like reproductive and sexual health of a woman. It is directly proportional to lesser risk of Urinary Tract Infections (UTIs), reduced chances of Rashes, good reproductive health by avoiding Reproductive Tract Infections (RTIs) and decrease in risk of Cervical Cancer. Apart from these, it also helps in boosting self-confidence, mental peace and maintains cleanliness by preventing bacterial vaginosis and Toxic Shock Syndrome (TSS) an infection caused by Staphylococcus aureus bacteria which may result in shock, renal failure or ultimately death.

Menstruation is the criteria on which the pregnancy depends and maintaining good menstruation hygiene has a direct impact on the fertility,

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contraception and various hormonal changes taking place in a woman's body. In broader terms, it affects the sexual and reproductive health of a woman's body. Dominant menstrual disorders include bacterial vaginosis, vulvovaginal candidiasis, RTIs and sometimes even leads to HIV infection. Besides these, there are other menstrual related indications like anemia which causes maternal mortality, Endometriosis leading to infertility and dysmenorrhea that affects a woman's health and their routine lifestyle activities. Major reasons that contribute to the inferior menstrual hygiene management include use of inappropriate tools of menstrual protection, extra absorbent sanitary pads or tampons, using an unclean cloth or other materials like rags, newspapers, or grass. All these factors directly or indirectly are caused due to lack of menstrual awareness, education which is due to the inferior economic status of the people of the country[2].

## Consequences of Poor Menstrual Hygiene

A medical expert at Flo said that menstrual cups are not accountable for causing any type of infections, but incorrect usage and inferior menstrual hygiene management are the possible reasons for such unwanted effects. Approximately 70% of the contraceptive contamination in Indian females are brought about by deprived feminine cleanliness. There are severe wellbeing hazards during the menstrual cycle if sufficient clean procedures are not followed. Some consequences would be:

- The extended peril of UTIs and RTIs
- **The disease of reproductive tract:** Contaminated items used to contain feminine blood are favorable places for a few microorganisms like Salmonella, Staphylococcus and E. coli. These microscopic organisms can increase quickly in the regenerative plot beginning from the cervix and upwards. They can enter the circulatory system straightforwardly from the mucosal layer which is profoundly porous. This can prompt sepsis and related entanglement.
- Not changing clean napkins regularly can add to dampness maintenance and quicken the development of destructive microorganisms.
- Any contaminated item can change the pH of the vaginal locale. This causes an adjustment in the microflora of the territory, accordingly, expanding the danger of bacterial vaginosis. The normal manifestations displayed by ladies experiencing RTI are genital itching, back pain, stomach torment and pustules over genitalia, and abnormal genital release.
- **Yeast disease:** A yeast exposure called Candidiasis is usually brought about by inadequate feminine cleanliness. Candida albino is an entrepreneurial organism that can cause disease in the contraceptive parcel and urinary plot. Vulvovaginal candidiasis can influence 75% of ladies of the regenerative stage and is generally asymptomatic.
- **Hepatitis B contamination:** This infection is effectively sent via organic liquids, as well as feminine release. Thus, it is imperative to wash hands completely with cleanser and water after and before changing sterile napkins. The equivalent is valid for explicitly sent illnesses like HIV, candidiasis, and Trichomonas disease.

- **The extended peril of cervical cancer:** The cervical disease is the malignancy of the cervix or the uterine opening which is overwhelmingly brought about by the Human Papilloma Virus. 1,32,000 Indian women generally tend to have cervical malignancy every year. The absence of feminine cleanliness is the main consideration that adds to the improvement of this sickness.
- Perilous evacuation of waste and not washing hands frequently may cause the spread of pollution like Hepatitis B and Thrust[4].

## Parameters Affecting the Usage of a Menstrual Cup Safety

Menstrual cups are safe devices if you use them with clean hands, proper hygiene, and wash them appropriately. One should use a disposable product, like pads or tampons if they cannot maintain the hygiene practices which are required for using a menstrual cup. No adverse reactions have been observed with the use of these cups related to their use have been found. The non-absorbent property and the filling capacity of these cups make it unique and don't cause any vaginal mucosa irritation. Toxic Shock Syndrome (TSS) caused by a menstrual cup is very negligible which makes it a better device than the disposable products. The major benefit of a menstrual cup over a tampon is that it is made up of silicon or rubber and it does not include carboxymethylcellulose, which would accumulate a lot of blood and eventually provide a medium for bacterial growth. Therefore, the cups have been used as an effective alternative to the tampons. [5] No safety parameters were adversely affected [6-7]. More than 90% of the surveyed medical students reported the cup to be a safe device with no health hazards and that it could be used by the virgins as well. Menstrual cups have been tested among women, showing their increased preference for use over their usual practice and having no safety issues [8]. An ob-gyn professional and medical expert states that a cup functions by accumulating the menstrual fluid and its appropriate usage are very safe and hygienic [3].

### Pilot report case study (TSS, Hydronephrosis, IUD)

**Toxic shock syndrome (TSS)-** Rare inflammatory response-toxicogenic strains of staphylococcus aureus. S aureus TSS toxin 1 (TSST-1) is accountable for several organ failures in almost all (95%) patients with menstrual TSS. This case study reports a rare case of menstrual TSS per the usage of a menstrual cup in a 33-year-old female. It was found out that she had used the same cup for the last 4 years. Later, the full recovery of systolic function was achieved [5]. 37-year-old women started using the Diva Cup 10 days before her presentation to emergency with a two day record of fevers, conjunctival hyperemia, abdominal cramps, and myalgias, vaginal discharge and diffuse erythroderma prominent on her upper thorax, inner thighs, and perineum- first case of TSS using a menstrual cup [9]. Accretion of blood in the polyester foam cubes and chips of carboxymethylcellulose. Menstrual cups are manufactured of silicone or rubber, and carboxymethylcellulose is not utilized in their composition. The crucial role of silicone is that it itself does not sustain any microbiological growth. [9] Accumulation of blood in the polyester foam cubes and chips of carboxymethylcellulose. Menstrual cups are made of silicone or rubber, and carboxymethylcellulose is not used in their structure. Silicone itself does not support microbiological growth. [9] Menstrual TSS is a rare but severe disease that occurs in women

using intravaginal protection such as tampons or menstrual cups who are vaginally colonized by *S. aureus* producing TSST-1 [10]. There was a 10.8% occurrence of *S. aureus* in 14-16 year olds. However, no numerical variation was found in the occurrence of *S. aureus* and when there was an intervention done with cups and pads, no considerable disparity was found. Any case of mTSS was not detected and TSST-1 was not observed among females who were using cups and had verified *S. aureus* colonization [11].

**Hydronephrosis:** Is a very rare complication due to menstrual cup which arises due to improper size, shape and positioning of the cup [12]. It is a condition that leads to swelling of one or both the kidneys which fail to drain out urine to the bladder. A 30-years old patient reported a case of extreme renal pain that was diagnosed as hydronephrosis due to the menstrual cup. The dislocated cup was responsible for blocking the left distal ureter. All the symptoms and the condition were relieved after the discontinuation of the cup [13]. Another similar case of right renal hydronephrosis has also been reported by a 26-years old patient [14]. 25-years old woman was reported with right flank pain. She had been using a menstrual cup since a few months and had reported the pain on percussion. Her urinalysis was normal except microscopic hematuria. Her right renal was suspected and on doing computed tomography confirmed right ureterohydronephrosis. It was discussed that the menstrual cup should be inserted to be around the cervix however she had introduced it laterally which is improper. It was concluded that menstrual cup is a secure way to collect the menstrual fluid with very rare side effects [15].

**Early IUD expulsion with concomitant cup use :** It is a condition which may be caused mainly due to two mechanisms: (1) actual pulling of IUD strings during cup removal and (2) displacement of IUD when suction created by the cup breaks [16]. In total, we found 3 studies on this subject. In the first study, 13 out of 71 concurrent cups and IUD users reported early expulsion [17]. In the second study, 3.7% of 137 cup and IUD users reported early expulsion [18]. In the third study, seven cases of early IUD expulsion with simultaneous cup use were reported, out of them, six women chose to reinsert IUDs, and out of these 6, two discontinued using menstrual cups and two had IUD strings cut short [16]. The authors of two studies also highlighted the need for the users to be careful while removing a menstrual cup when an IUD is inserted [16,17]. A significant association between the simultaneous cup and IUD use followed by expulsion was found in the three studies that we found in our literature review, but further research is needed on this subject to establish a conclusive relationship [16-18]. Medical experts do not recommend concurrent use of a menstrual cup and an IUD because there are chances of dislocating the IUD during the removal process of the cup. This is a major disadvantage for women having IUD inserted and are therefore endorsed to use pads or tampons for menstrual protection [3].

## Hygiene

In India, out of the total 335 million menstruating women, only 42.6% make use of the highly fundamental form of any menstrual hygiene product. Women are compelled to use unhealthy menstrual hygiene products due to their monetary conditions and less awareness. This leads to exposed health risks during periods. Menstrual cups give women the opportunity to lead a safe and hygienic menstrual cycle.

Menstrual cups do not absorb blood like tampons and sanitary pads which would give a higher probability of getting an infection. They can be used for 4 to 5 years and are usually sterilized or disinfected once in between each cycle to maintain proper hygiene. 100% reported the cup as the sole hygiene product [19] 80% of the female volunteers reported that menstrual cup was found to be hygienic [20]. Hygiene is the most important factor while selecting menstrual products [21]. Genital areas are washed using soaps or other vaginal hygiene products. A study in the UK showed that women believed that Moon cup i.e., a menstrual cup can be an alternative to the conventional sanitary protection and also believed the first most important parameter to be taken under consideration was hygiene and also environment friendly [22]. In one of the surveys conducted among the adolescent girls living the dang district of Nepal revealed that only 2/3rd population of these girls followed good hygienic practices, while the rest followed poor practices. This was based on the socioeconomic and sociodemographic factors associated with those girls. It was evident from the survey data that girls with lesser members in their families and literate fathers had better menstrual hygiene practices than the ones where the mothers of the girls were literate [23]. One of the directors of gynecology research at a University at New York said that many studies indicate the usage of menstrual cups is more than the other menstrual hygiene products and that most of the women participated in the research. These cups have shown to have no rashes or no scratches [24].

## Cost

A menstrual cup is a type of reusable hygienic menstrual management product which has a minimum usage of 2 years and can last for 10 years. The cost of one typical tampon is \$0.24 or of a pad is \$0.23 and the median number of these products used is around 169 pads/tampons per year which is almost equivalent to a cup that costs around \$ 39.99. This supports the point of the cup being cheaper and better than the other protection products [25]. 70% found the price to be very good and reasonable in comparison [3,4] It has been reported that a menstrual cup is not only ecofriendly but is also cost effective and could be used for 10 years without causing any adverse health effects [26]. It has been noted that the cost of tampons for a woman per year is the same as the cost of one menstrual cup at current South African prices. The MPower menstrual cup retails for Rs-265 while a box of 32 tampons costs Rs-40 [27]. In Zimbabwe, it was observed and noted that the volunteers prefer to use cloths or rags rather than any commercial device. They believe that menstrual product supply is short and prohibitively expensive and hence they cannot afford expensive products like menstrual cups [28]. In rural Kenya, the cost of menstrual cups is estimated to be \$2,730 per year for 1000 girls compared to sanitary pads which were \$22,420. Therefore, menstrual cups are shown to be more cost effective [29]. An expert at Bloomberg School of public health says that the menstrual cup is the choice of protection for many due to its both cost and waste saving salient feature [30]. Dr Osawe, a gynecologist and obstetrician at Piedmont conferred that menstrual cup is a one-time investment which is paid off in a very little time with all its supreme features [31]. These cups ranging from Rs.500-Rs.2000 mainly work on the principle of collection of menstrual blood instead of just absorption which is used in tampons and sanitary pads [24].

## Pollution

The disposable products like sanitary napkins and tampons take up 25 years to shatter along in the sea and can produce a considerable ecological influence. Recyclable sanitary options are also obtainable, and these decay in a brief time, although they must be composted, and not set off in a landfill. After considering the waste generated by 10 years of a cup, it was observed that the cups only contribute to a smaller fraction of total waste generated from using pads and tampons. Once the durability of these cups is over, they can be dumped into the landfills and incinerated as they are made up of silicone, which does not cause any harm to the environment. The menstrual fluid can also be poured into a small pit in the soil, and it works as a plant fertilizer which gets rid of all the pathogens causing sexually transmitted diseases.

State of India's Environmental 2019 survey reports that out of 336 million menstruating women, 121 million women use sanitary napkins creating a waste of 12.3 billion throwaway napkins every year. But if this gets replaced with just one cup for every woman, it will not only reduce the waste but also become a cost effective product. To cope up with the menstrual waste, our country needs education and awareness about the reusable cup [9]. Menstrual cups would effectively reduce the waste generated with the usage of other products. Considering both the female population and no. of products used by each woman in a year we understand how 1 cup can reduce this waste [2]. 98% found it to have an excellent impact on the environment [5]. In a study conducted in Bangalore, India, among 163 gynecologists and obstetricians in the public hospital and private hospital settings, 93% of participants reported that menstrual cups are more environment friendly than sanitary pads [32]. The growing problem of menstrual waste and disposal of used sanitary napkins is an environmental issue and menstrual cups can resolve the disposal issues from sanitary napkins [21]. Ordinarily made of clinical evaluation silicone or latex elastic, they're reusable and recyclable so they are an environmentally friendly option and will save money in the long haul [33].

## Comfort

A menstrual cup is a feminine hygiene device inserted into the vagina during menstruation. It is a perceived notion that menstrual cups are not comfortable and easy to use due to less awareness and not marketed enough compared to other menstrual products which are heavily marketed. But through continuous case studies and trials, women have found menstrual cups comfortable with each use. It was observed that the mean score of satisfaction in terms of comfort was higher with the menstrual cups than that of the tampons [2,3]. 96% were satisfied with product comfort [4,5]. There were few complications related to the menstrual cup in terms of migration and fixation of the cup in the vagina that led to a confirmed reported case of Hydronephrosis in a 30-years old patient [34,35]. The cup was preferred for its comfort and less odor. There were a few side effects like rashes and dryness [36]. 90% of the athletes faced no discomfort during sports [37]. A recent study in India showed that discomfort of sanitary napkins like rashes and leakage are eradicated with the alternative use i.e., menstrual cups and comfort are attained [38]. Almost 81% of women in Zimbabwe did not face any discomfort at menarche, 98% in the 2nd cycle and 100% by the 3rd menstrual cycle [39]. In Western Kenya, approximately 22% of women faced discomfort in the first few months of usage [40]. The medical ex-

pert mentioned that a cup is not only safe and hygienic but it also allows women to perform their routine activities like training, exercising and swimming without any fear of its position [3]. Along with the easement, the cups do not cause any foul odor as the smell of the fluid does not come in the contact with the air like that in the pads, which makes it a better tool than the other says the Piedmont gynecologist [31].

## Leakage

The first and ideal role of any menstrual product is to cause absolutely no leakage. Menstrual cups have significantly shown to have minimum leakage after each use and shown to be ideal. Mean score of satisfaction with leakage as a parameter was higher for cups (5.4) as compared to the tampons (4.8) [2], more than 90% rated for very good absorbability [4,5]. Leakage was rated equally for all the products [3]. Most of the complaints were of leakage of the menstrual fluid [20]. 63.3% of the athletes experienced leakage during sports which kept reducing with each cycle [13]. The problem of leakage was encountered in 3%-6% [41].

Only 3% of women in Zimbabwe experienced leakage in up to three menstrual cycles [39]. There were few factors in terms of the usage of the cup that affected the buying intention of women in India.

- Touch of menstrual blood restricts the usage of cups.
- Fear of using menstrual cup causes infection/allergy/irritation.
- Uncomfortable to use menstrual cups in public washrooms.
- Sterilization of cup after each cycle is an issue.
- Usage of menstrual cups do not cause unpleasant odor as there is no chemical reaction.
- Doubtfulness about the holding capacity of menstrual cups.
- Fear of new menstrual products causing leakage [21].

A study in Canada showed the menses cup is believed to be an alternative solution over pads and tampons as it is shown to have less spillage and more comfort [42]. Most of the participants expressed that with the cups they felt free and had no fright of being embarrassed due to leakage or any regular menstrual problems [43]. The fundamental goal of creating a menstrual cup was to overcome the problems of leakage and as stated by a medical consultant, a typical cup does not leak as it creates a seal and if it leaks then there are chances of incorrect positioning or improper size of the cup [3,31]. Cups if inserted properly would not lead to any leakage [24].

## Insertion-removal

Since menstrual cups are to be inserted inside the body, they are often misinterpreted to be harmful or painful. Although it was found that the insertion of menstrual cups was not that difficult. A proper technique of folding the cup before insertion was followed to ensure that it fits properly and does not create an airgap which may result in bacterial accumulation. While some safety and precautionary tips for removal were followed to avoid spillage and mess after. For both these parameters, the mean score of satisfaction was slightly lower for the cups than for the tampons. [25]. Disposal and convenience were rated slightly lower for the cups [6]. Increase in ease of insertion from 38% to 96% in the 3rd



usage. 91% found it to be convenient [19]. A mean for the insertion and removal was recorded, to be out of 5, and it was found out to be 3.0 for the insertion and 2.6 for the removal. By this information, we can interpret that around 60% were able to insert it without any problems and around 52% were able to remove it without any trouble [20]. Insertion was easy for 80% participants and 90% of participants found removal easy [41]. Women playing sports considered the insertion and removal of the menstrual cup very easy [37]. Almost 81% of women in Zimbabwe experienced no discomfort in insertion during the first menstrual cycle, 96% in the 2nd cycle and 100% in the 3rd cycle [39]. In one of the pilot report case studies of Uganda Red Cross Society project, it was found that some of the women found difficulty in either inserting or removing the cup but eventually, they found it to be comfortable and that it makes them work like when they are not in their periods [43].

The overall usage of the menstrual cup became significant after it was recommended by a friend. Yes, the insertion and removal process of the cup became easier by 25% after a friend explained the entire usage of the technology. Peer pressure worked affirmatively in this case as the usage of a newer technology citing health benefits was accepted at a better rate once it came by a close friend. This psychology also was based on the fact that friends would prefer using new technology for the first time if it was backed by their other friends [44]. A study in rural Uganda showed that participants who did not have much knowledge overcame initial challenges mastering the technique of insertion and removal after a lot of practice [45]. In a study conducted in schools of rural regions of western Kenya, problems with insertion and emptying declined from 21% in the first 3 months of provision of menstrual cups, to 3% after 9 months [46].

The Flo consultant suggested a few steps for insertion and removal of the cup-it begins with washing the hands thoroughly and then folding and holding the cup in a C-fold, allowing it to insert into the vagina while tilting it towards the back part of the spine. The ideal duration period for one-time retention is 12 hours, after which the cup is supposed to be removed carefully. The removal process is quite easy and is done simply by pushing the cup with two fingers on either side and then throwing it outwards. It is then re-inserted following the same steps after emptying and cleaning the cup appropriately with a special napkin. The cup can be boiled for 5 mins-10 mins at the end of every cycle, making sure that it does not destroy the silicone material [3]. A rare case where a 20-years old woman had to undergo surgical removal of an inserted menstrual cup as a speculum examination was carried out and later it was found that the cup which was inserted last night had penetrated deep inside the vagina and was firmly lodged up the cervix. Hence, proper knowledge of removal should be made understood to all before its use is made normal. It can be interpreted that long hour's usage of the cup is not recommended as it should be changed within a gap of 6 hours-8 hours at maximum [35].

### **Uro-vaginal symptoms**

Uro-vaginal symptoms include vaginal abnormalities like vaginal fistulas, urethral diverticulum, pelvic pain, and other urinary tract infections. Uro-vaginal symptoms were almost negligible in both the groups and no evidence of irritation observed (cups and tampons) [2-4]. 96% rated it to have excellent compatibility with the body [5]. The first ever confirmed case of TSS reported a black vaginal discharge which was

then followed by a yellow secretion together with fever and irritation following which the woman stopped using the cup [7]. Cups were reported to be better than any other product by the Uganda Red Cross society as it did not cause the skin irritation. The gynecologists stipulated that menstrual cup neither caused reproductive tract infections nor increased the risk of urinary tract infections among study participants [35]. The risk of contracting any uro-vaginal disease was at high risk in case of any concurrent use of IUD (Intrauterine Devices) which was not particularly prevalent while using sanitary pads or tampons during menstruation [35].

A woman had complained about throbbing pain in the pelvic region and after multiple diagnosis and tests which were all negative for pregnancy, cancer, abdominal discomfort, etc., it was later seen that it was in fact because of a deeply integrated menstrual cup. This was associated with mild right hydroureteronephrosis and a mildly delayed right nephrogram [47].

Bacterial vaginosis causes infertility in women and should be treated effectively with the proper usage of antibacterial. However, menstrual cups were not preferred by any of the volunteers in the study over other conventional products like sanitary pads and tampons [48]. Few studies prove that these cups have no negative impact on the vagina and the cervix, and they cause no harm to the helpful flora present in these regions. The obstetrician gynecologist in New York Lenox Hill hospital mentioned that cups are not entirely free of risks, in fact she also mentioned not following the norms of a typical menstrual cup usage might lead to various problematic situations [30].

### **Awareness**

Menstrual cups have been accessible to people for years now but the major reason for its lack of usage has been found because of lack of publicity and awareness of it. When we talk about a product that is used for women's hygiene and safety, the opinion of the medical students and health professional's matter. 7% of the 400 medical students had no idea about what a cup is and the rest of them did not have any vital information regarding its use. Another reason stated for its less popularity is that India is a conservative country where people do not want to insert a cup into the vagina due to some outdated orthodox believes [9]. When asked if the women had heard about menstrual cups, 246 out of 300 had marked a 'Yes' which accounts for 82% of the study population [10]. It was found that awareness was low among women who attained menarche at an early age [49]. It was also noted that women with higher awareness levels about menstruation were comfortable with talking about menstruation [49]. Although 42.7% of people were aware of the menstrual cup, 96.9% people preferred to sanitary napkins followed by the sanitary cloth which was 15.5% [49]. Afraid to make first time investment due to uncertainty of the size of the menstrual cup. It was observed in one of the articles that product awareness is one of the top 3 factors that reflect the buying intentions of women in India. Menstrual cups are safe, effective, long lasting and largely unknown. Its lack of awareness restricts the shifting to new menstrual products. Lack of effective promotion is hampering the new menstrual product purchase [21].

The reported awareness of women was studied concerning their sexual orientation and relationship statuses as well and it was found that 137

lesbians (11.0%), 874 heterosexuals (70.2%), and 234 bisexuals (18.8%) in this sample, and 41.3% of heterosexual females had high MCU intention, whereas 51.1% of lesbians and 51.3% of bisexuals had high MCU intention. As for relationship status, 54.9% of girls who were in a steady relationship but lived individually had high MCU intention. Besides, 52.8% of college girls who had sexual intercourse and 55.1% of those who ever involved in insensitive masturbation also had high MCU intention [50]. A study in New Jersey, USA showed that women had more awareness and positive attitude of using menstrual cups rather than using IUD [51]. It is a known fact by now that the awareness about both the unique features and the usage of the menstrual cup is quite low. A study referred by one of the experts at the public health school in Baltimore states that only 30% of the women educational websites talk about menstrual cups as an effective tool for hygiene management [30]. One study showcased the market analysis of menstrual cups based on region across the different parts of the globe and showed that high awareness was exhibited concerning the advantages of utilizing feminine cup and accessibility of high extra cash among the woman populace likewise help to support the market in North America locale [52].

Me Luna, Lady Cup, Ruby Life Ltd., Lunette, Irisana S.A., The Keeper, Inc., V cup, Anigan, Fem Cap, Inc., and Diva International Inc., are known to be conspicuous players in the Menstrual Cup market. These organizations have gone above and beyond from online channels to computerized advertising to make their specialty. Online channels offer protection to clients with buyers deciding to purchase clean items at their carefulness. Advertising at such a huge platform has resulted in awareness on a very large scale [53].

### Overall satisfaction

Based on the above parameters, it was observed that with an increase in the study cycle, the overall satisfaction for the cups increased whereas there was a decline in the tampon group. In all, the satisfaction mean score for the cup was higher than that of the tampons 5.5 vs 5. 91% of the 89 women agreed to continue with the cup. 37% rated cup to be better, 34% rated equal to pads or tampons, 29% rated cups worse than [3]. 92% found the cup to be better than usual product and 96% would recommend others to use. 84% were satisfied [5] Study showed that the degree of general fulfilment throughout Sports was found to be extraordinary (82%) [37]. The overall experience of trying the menstrual cup was for all the Uganda Red cross participants either very good (75%) or good (25%) and that it also boosted up their self-confidence by improving their lifestyle [43]. One thing was noted that after the girl used the cup once, her continued usage was extremely high to about 91% [54].

### Conclusion

Despite years of presence of this menstrual hygiene product in the market, a large population of menstruating women and mothers who would recommend the product to their daughters remains skeptical about it. The lack of widespread advertising and commercialization of the product is the primary reason behind poor awareness about the product. Our research based on various studies and findings on the topic reveals that most of the female population is shy or unsure of trying new and quirky products at least for the first time as the product needs to be inserted into the vagina, many feel uncomfortable. Whereas many would greatly and affirmatively recommend this product to others once they

are acquainted with the insertion, removal, and other benefits of the product. We aim to study these parameters in detail in part two of our Research project and aim to find out how well and regularly women would prefer to use menstrual cups over other products if they were well versed with its usage and advantages.

### Recommendation

Menstrual cups as a modern and effective menstrual hygiene product are recommended given their superiority in terms of cost, quality, and comfort after initial use, compared to the other conventional and environmentally hazardous products like sanitary pads, tampons or cloth in some places. This report has only investigated the present prevalence of the product and its awareness amongst the population of varied age-groups, country and across different cultural backgrounds. The production rate and costs have been briefly assessed and a boost in the market demand should be quantified to make the product more viable in the market. Further research is required to understand consumer psychology firsthand and the willingness of women to use the product after its effective marketability and understanding of the usage of the product.

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