



Comparing Menstrual Cup and Sanitary Pad: Effectiveness and Adaptability in Menstrual Hygiene Management

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Date of Submission: 09-04-2024

Date of Acceptance: 23-04-2024

ABSTRACT: Menstrual hygiene management (MHM) access continues to be a major barrier for Indian women, particularly in rural regions. Menstrual cups and sanitary pads have been available for decades, women are using them as per their availability and convenience. There have been some documented advantages, nevertheless, such as better health and cleanliness management during menstruation. Understanding of the versatility and effectiveness of sanitary pads and menstrual cups as superior alternatives to traditional methods. The purpose of the study is to assess the suitability of menstrual cups and sanitary pads for menstrual health and hygiene.

KEYWORDS: Sanitary pad, Menstrual cup, Menstrual hygiene, Toxic shock syndrome.

I. INTRODUCTION

The menstrual cycle is a physiological event. But in emerging nations like India, it has been connected to numerous religious taboos and customs. Ethnic, religious, and traditional values might result in a variety of restrictions that ladies experience during their menstrual cycle. These taboos menstruation-related issues go beyond historical context interest. Menstruating females still frequently do, during their period, isolate themselves at home. Some of them choose not to take a shower or a bath [1]. Menstrual management is not only challenging in underdeveloped countries, but it can also seriously harm women's lives. Even where taboos are not a significant issue, there may not be any readily accessible or reasonably priced menstruation collection supplies. Simply put, there aren't any efforts made to create low-cost materials [2]. Women use cloths; however, for the majority of

women, washing the garments or properly discarding the pads is an issue. Many cultures force women to use rags, which must be reused, but washing them might be difficult due to a lack of water or the need for privacy to wash and reuse pads, which leads to the forced use of moist or even wet, contaminated rags [2,3]. Sanitation Protection: Every Woman's health Right, an A. C. Nielsen study from October 2010, offers a detailed review of the pervasive unclean behaviors in India. The sample included 1033 menstruating women and the 151 Gynecologists who examined them. According to the survey's findings, 88% of women use startling at-home alternatives, while only 12% of women use sanitary napkins [4]. Blood is lost through the vagina during menstruation, which is normal aspect of the reproductive cycle [30].

Most women experience some level of discomfort and annoyance during this time, which has a significant effect on their day-to-day activities. Even so, it's still considered taboo and rarely discussed in the majority of the world. Therefore, the management of menstrual hygiene is significantly impacted by socio-cultural factors [31]. Women and girls have access to water and sanitation facilities to maintain their menstrual hygiene [32]. Water and sanitation have prevented the management of menstrual hygiene. As a result, many women and girls are unable to perform daily tasks with dignity, such as washing and taking care of their health and education [33]. According to studies, girls are not properly informed about menstruation. They are more likely to get reproductive tract infections (RTIs) as a result of their poor hygiene [34]. Therefore, it is crucial to have access to knowledge regarding menstrual hygiene [35].



Menstrual cup

A menstrual cup is a device for controlling menstrual flow and is promoted as a healthier and more environmentally friendly option to traditional menstrual sanitary products. The history of vaginal gadgets is lengthy and fascinating. The first device was patented in the United States in 1867 [5]. Even though menstruation collection-specific early vaginal cups have been available in industrialized nations for many years, they have never gained popular use. Menstrual cups and other reusable menstrual items are less expensive than disposable ones. In underdeveloped nations like India, the menstrual cup has been investigated as a method of controlling menstrual hygiene [6].

Menstrual cups and other reusable goods are less expensive than disposable ones.

Menstrual cups have been investigated as a menstrual hygiene management tool in poor nations like India [7].

Menstruation cups have been shown to provide benefits. There is a few clinical study, but there are still a lot of unknowns.

Therefore, more research is needed to evaluate the menstrual cup's effectiveness and user adaptability as a menstrual sanitary protector substitute [8].

The study employed an internally worn menstrual cup with a flexible rim measuring 44mm in diameter, which serves as a reservoir with thin walls to collect and retain menstrual fluid. For ease of insertion and removal, minimal bulk was considered throughout the design [9].

Inserted, it covers the cervix and opens into an oval form that lies between the pubic bone's notch and the posterior fornix.

Grasping the rim behind the pubic bone with one finger allows for removal.

It is composed of silicon that is safe, non-allergic, and of health grade [10]. The vagina is used to implant a menstrual cup, but the container, which has a capacity of 10–38 mL, is where the blood is collected. Depending on the kind of cup and the flow of the menstrual cycle, the menstrual cup should be emptied every 4 to 12 hours [11]. There are two types of cups available: a cervical cup, which is positioned high in the vagina and, like a diaphragm for contraception, is inserted around the cervix, and a vaginal cup, which is typically bell-shaped and placed in the vagina. There are disposable single-use menstruation cups available, as well as menstrual cups constructed of

medical-grade silicone, rubber, latex, or elastomer that can last up to ten years [12].

Potential risk

Period cups carry certain possible hazards, despite the fact that many people use them without any problems [13]. The hazards associated with utilizing other internal menstruation products are identical in many cases. There are some following risks [14].

- Infection
- Minor injury or pain
- Allergic reactions
- Urinary tract problem
- Dislodging an intrauterine device (IUD)
- Leakage
- Toxic shock syndrome

Leakage

Menstruation cups may leak while being used, just like any other menstruation product. If the cup is overfilled or fits poorly, leakage is more likely to occur [15]. Leaks are less likely if you use a cup that fits well and empty it frequently. When a menstrual cup fits properly, it forms a "seal" around the vaginal wall and stays in place most of the day [16].

Pain and minor injury

Any instrument inserted into the vagina may cause minor damage or pain. These problems are particularly common in those who use a too large cup, have long nails, or insert a menstrual cup aggressively [17].

Rashes and allergic reactions

Any product may result in an allergic reaction or skin allergy. Those who use menstruation cups may also experience this in rare instances [18]. Merely six cases (0.18% of the total) involving allergic reactions or rashes induced by cups were reported in the Lancet review. Because menstruation cups are made from a variety of materials, some people may find that a certain brand is more effective for them than another [19].

Toxic shock syndrome

A strain of *Staphylococcus aureus* is the causative agent of toxic shock syndrome (TSS), a dangerous and potentially fatal bacterial illness. Though it is most frequently linked to tampon use, menstruation cup users may occasionally experience it [20].



Certain proponents of menstruation cups refer to previous studies. According to a reliable source, tampon related superabsorbent materials (TSS) are exclusively used internally by those who use them. The use of menstruation cups may also increase the risk of TSS, according to new research [21].

Infections

Compared to other period products, menstruation cups carry a higher risk of infection. Compare to tampons or pads, cups are less likely to result in infections, according to several of the included studies. Even so there is a slight chance of infection when using cups, and that risk rises if one does not maintain clean cup [22].

Any instrument fitted into the vagina could irritate the urethra and maybe spread bacteria to the urinary system. Some people who use period mugs discover that this happens. In rare cases, the mug could also press up on the urethra and circumscribe it, making it delicate to urinate. Nine people (0.27%) with urinary symptoms were found in the Lancet review. Three of them went on to develop hydronephrosis, a dangerous illness that results in Kidney enlargement when urine cannot pass. An infection caused by a type of *Staphylococcus aureus* is known as toxic shock syndrome (TSS), which is dangerous and may be fatal [23]. The most frequent association is with tampons, although in extremely rare instances, it can also affect women who use menstrual cups [20].

Sanitary pad

Sanitary napkins have two main purposes: they absorb and hold on to menstrual fluid and isolate it from the body. No leaking, no unsightly appearance or color, no odor, no noise, stay in place, pleasant to wear (slim body form), and a high level of hygiene are significant and desired characteristics. Girls and women who can manage their periods with safe, cheap sanitary products are less likely to contract infections. This may have a domino impact on other aspects of sexual and reproductive health, such as teen pregnancy rates, maternal outcomes, and fertility [24]. However, poor menstrual hygiene can lead to major health problems, including urinary and reproductive tract infections, which can cause infertility in the future and complicate childbirth. Infections like hepatitis B and thrush can spread if hands aren't washed after changing menstruation products [25]. Girls

and women are less likely to have infections if they can control their periods with safe, affordable sanitary products. Other areas of sexual and reproductive health, such as teen pregnancy rates, maternal outcomes, and fertility, may be negatively impacted as a result. However, poor menstrual hygiene can result in serious health issues, such as urinary and reproductive tract infections, which can impair fertility later on and make childbirth more difficult. Infections like thrush and Hepatitis B [8]. According to studies, providing sanitary pads to girls significantly lowers the incidence of bacterial vaginosis and STDs. Menstrual fluid is held in place by sanitary napkins while also being kept separate from the body [26]. The majority of the time, sanitary pads are safe to use, but a small number of ongoing studies have documented an increased risk of genital cancer associated with the use of sanitary pads that contain dioxin and superabsorbent polymers. This is because the dioxin present in sanitary pads has the potential to accumulate in the body and result in cervical or ovarian cancer. Indeed, if a woman isn't having a heavy period, she should nevertheless change her sanitary pads every 3 to 4 hours. Sanitary pads contain some ingredients that may be harmful to the body. Some of them are **Dioxin**: This substance is used to bleach sanitary napkins. Dioxin poses a number of potential health risks and can be extremely detrimental to the body. **Pesticides**: The pesticides that were sprayed on the cotton by the farmers during cultivation are frequently present in the cotton that is used to make sanitary pads. **Artificial fragrances**: Artificial fragrances are made of unsafe substances. For odor management, most pads have deodorants or odor neutralizer [8].

But using scented pads has the risk that they will harm your fertility and possibly endanger the lives of the unborn child. Smells' chemical components have been connected to both birth abnormalities and detrimental effects on embryonic development. Experts advise against using perfumed feminine hygiene products because of this. They irritate the skin and raise the danger of additional diseases, such as vaginal yeast infections [27]. Fungal infection may happen as a result of moisture accumulation. Allergies and skin irritations could be brought on by the polymers used in sanitary pads. Because sanitary pads cause the aforementioned problems, it is vital to switch to reusable, reasonably priced menstruation care items



[28]. The adoption of sanitary protection items influenced by individual Preference, social pressures, financial circumstances, and accessibility in residential area. Rural and urban women, as well as girls, differ in the absorbent fabrics they choose. While disposable sanitary pads are preferred in cities, cloth pads are more frequently used in the rural areas [28,29]. People are now aware of the easy-to-decompose and environmentally friendly biodegradable pads composed of bamboo and banana fiber. Biodegradable pads don't cause rashes and don't contain chemicals. These pads are comfortable to use, degrade quickly, and are incredibly effective and lightweight [36]. Although they cost more than plastic pads, biodegradable pads don't have any negative health effects [37].

Instead of using commercial, non-biodegradable sanitary pads that wind up in landfills, sewers, fields, and aquatic bodies after disposal, they offer an environmentally friendly, biodegradable sanitary pad [38]. Furthermore, this pad is a substitute for store bought pads that are

compost of plastic, cellulose gel, chemicals, bleach, and sent. These pads can cause major health problem like cervical cancer, UTI's, infertility and birth defect [39].

Some biodegradable sanitary pads

Bamboo fiber pads : Bamboo fiber is utilized as an absorbent material for menstruation pads instead of wood fiber. Bamboo fiber has certain special qualities that make it simple to weave into cloth [40]. The 100% cellulose content of regenerated bamboo fiber make it fully environmentally friendly and biodegradable [41]. It is safer to use and has a higher absorbency limit. Bamboo pads are incredibly soft and antimicrobial qualities [42]. Bamboo fiber has a higher potential for absorption than cotton fiber [43]. The menstrual cycle, free from pollution and irritation, is the result of this. Furthermore, bamboo fiber pads are available on the market with the benefit that blood stains are not immediately apparent and are naturally reusable [44]. The texture of bamboo fiber is depicted below by the following Z figure 1



Figure 1: (from left to right) Bamboo tree, bamboo fiber

Banana fiber pads: These days, inexpensive, hygienic pads made of banana tree fiber are marketed under the "Saathi" trademark in India for rural women. They break down after a year of usage and are environmentally beneficial [44]. As a byproduct of growing bananas, banana fiber is produced. Thus, for the modern sanitary pad sector, these fibers may be obtained at no additional expense. In addition to providing material fiber, the banana plant yields wonderful natural items. It thrives when it sends forth fresh shoots and is most

commonly seen in warm tropical climates [45]. Filaments are present in the bounty of all varieties of banana plants. These fibers are obtained from the gathering of bast fibers following the collection of the organic product. This facility has been a good source of high-quality resources for a while now, mostly from Japan, Africa, and Nepal, but also from other parts of the world [46]. The naturally occurring sorbent is banana fiber [47]. On hot days, the texture of this fiber will keep you cool and comfortable. The texture of bananas is



incredibly graceful and delicate, yet not quite as delicate as rayon or cotton [48]. Compared to cotton, almost all plant stem-based fibers are a little more coarse and stiff. Although quite comfortable, the texture of bananas may cause allergies. It is also biodegradable. It has a strong resilience to damage. It is resistant to fire, water, grease, and heat [49]. Even when compared to bamboo fiber, it has ideal spinnability and tensile strength.

Cellulose, hemicellulose, and lignin make up the majority of the chemical components of banana fiber. It has excellent abrasion and desorption capabilities [50]. Banana fiber is currently being used by a number of businesses to create commercial biodegradable sanitary pads. Here a grassroots process in this development is depicted in figure 2:



Figure 2: (from left to right) Banana tree, banana fiber, banana fiber sanitary pad

II. CONCLUSION

This study demonstrates how the sanitary pad and menstrual cup are low-cost improvements in hygiene and sanitation. Because sanitary napkins are more comfortable, rash-free, non-allergic, and toxic-free than menstrual cups, it can be inferred that using menstrual cups will eventually result in infertility, toxic shock syndrome, skin allergies, internal injuries, and general discomfort for some women.

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