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Reusable sanitary napkins—time to revisit

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ABSTRACT

Background To assess knowledge, attitude and practices (KAP) of women regarding menstrual hygiene and to evaluate the use of reusable sanitary napkins as an alternative to disposable sanitary napkins.

Methods A community-based cross-sectional study was done in two phases. In the first phase, 50 married women attending Gynecology OPD were asked to use reusable sanitary napkins for 2 months. A pre- and post-usage vaginal swab testing was done to rule out genital infection. This study was extended in the second phase to another 534 women after confirming that reusable sanitary napkins do not cause genital infection and are acceptable. KAP analysis regarding menstrual hygiene was done for all women.

Results In phase 1 of the study, the microbiological evaluation revealed no pathological organisms on vaginal swab culture after 2 months of usage. KAP analysis of 584 women revealed that only 26% women had awareness about menstruation before attaining menarche; in 51.88%, the primary source of information was their mother; 76.54% women in the study used disposable sanitary pads of which 15% were disposing of them unhygienically; 80.49% women found the reusable napkins comfortable and easy to use and 83.6% women confirmed recommending these napkins to others.

Conclusion Reusable sanitary pads are an effective, environment friendly, and cost-effective alternative to disposable napkins.

Keywords menstruation, menstrual health, menstrual health management, menstrual hygiene, reusable sanitary napkins

Introduction

Menstruation is a biological event that marks the beginning of the reproductive phase in a women's life, but not enough emphasis has been given to it and it is an issue which is still discussed behind closed doors. Management of menstruation is an under-recognized problem faced by girls and women especially in the low- and middle-income countries.[1] A young girl attaining menarche needs to be counseled both at home and in school about the physical and psychological changes associated with menstruation as lack of correct knowledge and unavailability of absorbent material is a significant factor for school absenteeism and dropout.[1,2,3]

The term 'Menstrual Health' encompasses the physical requirements during menstruation, the issues of privacy, water and toilet facilities, knowledge regarding absorbent material, its proper disposal and tackling the associated myths and misconceptions. In 2014, WHO and UNICEF came together to coin the term Menstrual Hygiene Management (MHM) and give it an official definition.[4]

On an average, a woman menstruates for 450 cycles in her lifetime and majority of the women use disposable sanitary napkins without realizing, that these plastic-lined disposable sanitary napkins are not only harmful to them but also to the environment.[5,10] According to the PATH study, the estimated annual solid waste of disposable sanitary napkins is 44 254cm^3 per female/year.[6] India is a developing

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country with ~310 million women in the reproductive age group whose menstrual problems have probably never been addressed.[7] The Government has launched various schemes to distribute free sanitary napkins to adolescent girls and impart knowledge through monthly meetings[8,9] but all these projects are short-sighted and do not address the issue of proper waste disposal. In times when the whole world is talking about single use plastic as a biohazard and moved toward banning the use of plastic, we as a society are regressing backwards by promoting plastic waste generation in the form of sanitary napkins.

Keeping this grim scenario in mind, this study was undertaken to assess the acceptability and safety of reusable sanitary napkins. It was conducted in two phases, in the first phase of the study, 50 married women were distributed reusable sanitary napkins. After evaluating their response 2 months later, the study was further extended to include 534 women in the second phase.

Material and methods

Study Design

This was a community-based cross-sectional study that was done in two phases from September 2019 to March 2020, after taking due ethical approval from the internal Ethical Committee of our institute.

Study Population

In total, 584 women residing in an urban slum and in the age group 18–40 years with regular menstrual cycles were included in the study.

Phase I

It was a pilot study in which 50 married women with the regular menstrual cycle and normal flow and with no signs and symptoms of pelvic infection attending Gynecology OPD of our institute were recruited.

An informed and written consent was taken from all participants after explaining the need for a per speculum examination and a high vaginal swab. Knowledge, attitude and practices (KAP) of the women regarding menstrual health was assessed using a predesigned questionnaire which was filled up by one person from the research team in the local language and their responses were recorded. A per speculum examination followed by a high vaginal swab was done in all women, which was processed at the microbiology laboratory of the hospital. Those women whose vaginal culture report was negative were given a set of five reusable sanitary napkins made up of charcoal and bamboo fiber and encased in a towel cloth. The women were explained how to use the pads with emphasis on washing and drying of the napkins. After 2 months of usage, a repeat vaginal swab culture was done. The acceptability of using these napkins during menstruation was assessed using a predesigned questionnaire.

Phase II

After documenting their acceptability and establishing that they do not cause any increase in genital infections, the study was extended in the second phase to another 534 women by approaching 15 Anganwadi's in the nearby district. An informed and written consent was taken from all women who participated in the study.

The study population was addressed in small groups of 15–20 women and KAP questionnaire was filled for all. All married women were examined by a per speculum examination to rule out and treat any vaginal infection. The unmarried girls who did not have any history of vaginal discharge were included in the study. Thereafter, a set of five reusable sanitary napkins were distributed to the study group. The women were recalled after a minimum of two cycles of usage to complete the data and a follow-up feedback questionnaire was filled.

Results

Of the 50 high vaginal swab culture done prior to distribution of reusable sanitary napkins, 29 (58%) were reported as sterile and growth of commensals was seen in 17 (34%) women. Two women were found to have growth of *E. coli* that was probably fecal in origin and two had candidiasis which was treated before giving them napkins. (Table 1) Eight women were lost to follow-up and the results of 42 women analyzed. In total, 85.7% women were comfortable in using reusable sanitary napkins provided and 90.4% were satisfied enough to recommend it to others. Thirty-five women (83.3%) found the soaking capacity of reusable sanitary napkins comparable to disposable napkins while three women (7.14%) found them better.

Microbiological evaluation after 2 cycles of usage of napkins showed no pathological organisms on vaginal swab culture in 40 women (including the two who had *E. coli* prior to distribution of napkins) (Table 1). This favorable acceptance of the reusable sanitary napkins without any increase in vaginal infection was the reason for the extension of the study to another 534 women.

A total of 584 women were recruited in both the phases of the study and KAP analysis regarding menstrual hygiene practices were analyzed for them. All the women in the study group belonged to low socioeconomic status. The majority of

Table 1 Microbiological evaluation of high vaginal swab culture

	Before usage of reusable sanitary napkins (n = 50)	*After 2 months usage of sanitary napkins (n = 42)*
No growth	29	26
Commensals	17	14
E. coli	2 (treated)	Nil
Candida	2 (treated)	Nil
Contaminants	0	2

Table 2 Demographic profile of the study population

Age group (years) (n = 584)	*Number (n = 584)*	*Percentage (%)*
18–20	127	21.74
21–25	199	34.07
26–30	112	19.17
31–35	96	16.43
36–40	50	8.56
Religion		
Hindu	389	66.6
Muslim	195	33.3
Marital status		
Married	376	64.38
Unmarried	208	35.61
Contraceptive use (*n* = 376)		
Barrier	212	56.38
IUD	98	26.06
Oral contraceptive	45	11.96
Tubal Ligation	21	5.58
Education status		
Illiterate	105	17.97
Primary School	229	39.21
Senior School	177	30.30
Graduate and above	73	12.5

women (34.07%) were in the age group of 20–25 years. The study group comprised of 35.6% unmarried girls and 64.3% were married women. In total, 17.9% of the study population was illiterate and 39.2% had received only primary education. The age of menarche was 12–14 years in 80.2% of the study group (Table 2). Of these women, 376 women (64.38%) were sexually active. The majority of the married women (56.38%) were found to be using barrier contraceptives.

Only 26% women had awareness about menstruation before attaining menarche. The primary source of information was their mother in 51.8% followed by elder sister in 22.08% and teachers in only 12.6%. 53.9% women were not aware about the cause of menstruation and 10.4% of them even believed it to be a curse of God or a disease. In total, 32.7% women thought menstruation occurred from urethra while 13.6% had no idea about the organ of menstruation. There were 250 women who had attended senior school and beyond. Of these, 76% women attended school during periods but 24% used to absent themselves during periods. The majority of the women (76.5%) used disposable sanitary pads. Of the 23.4% women who did not use disposable pads, 61.3% found them expensive and 31.3% felt shy to buy them from a male shopkeeper. In total, 29.6% women using cloth as absorbent were reusing the cloth after washing, while 70.3% discarded them along with routine domestic waste wrapped in a paper. In total, 15.8% women were throwing unwrapped dirty pads in the garbage (Table 3).

In total, 78.4% women felt dirty during menstruation and 20.03% even felt that men would become sick if menstruating women touched them. Forty-six percent women were not comfortable in watching advertisements related to menstruation with family and only 16.7% of married women were comfortable discussing menstrual issues with their husbands. Various restrictions were imposed on women during periods, the most common being not allowed to perform religious activities (51.5%) while 22.4% women were not allowed to enter the kitchen and cook during menstruation.

Of the 534 women recruited in the second phase, 2.99% ($n = 16$) women did not use the napkins due to reservations regarding washing and 36.7% women were lost to follow-up. On further evaluation, the demographic profile of such women was similar to the group who came for follow-up at 2 months. In total, 80.4% women found the reusable napkins comfortable to use. The reasons for discomfort stated by 71 women were slippage, genital rashes, inadequate soaking ability and bad odor. In total, 82.6% women found reusable napkins to be clean after washing while 15.1% women complained of stains and decreased softness of the cloth. In total, 529 women (89.89%) had bathroom facility at home and were washing the napkins at home and only 10.1% who were using public toilet facilities in the locality washed the napkins in those bathrooms. In total, 51 women (14.01%) found it difficult to remove stains. On enquiring further, it was found that they did not have 24 h water supply (only 324 {58.27%} had access to 24 h water supply) and had to wash all dirty napkins together the next morning when they found it difficult to remove the stains as the blood had dried up. They had to soak them in the detergent and then scrub them. In total, 44 (12.08%) women found it embarrassing to dry them out in the open due to small houses with common

Table 3 KAP regarding menstruation

Source of information	*Number*	*Percentage*	*Toilet facility at home*	*Number*	*Percentage*
Mother	303	51.88	Yes	525	89.89
Sister	129	22.08	No	59	10.1
Friend	59	10.1	Water supply at home	Number	Percentage
Teachers	74	12.67	Yes	556	95.2
Others (Media)	19	3.25	No	28	4.79
Cause of Menstruation	Number	Percentage	Taking bath during menstruation	Number	Percentage
Do not know	315	53.93	Yes	565	96.74
Physiological process	208	35.61	No	19	3.25
Curse of God	58	9.93	Type of absorbent	Number	Percentage
Disease	3	0.51	Sanitary pad	447	76.54
			Cloth	118	20.2
Body organ associated with menstruation	Number	Percentage	Toilet paper/cotton	19	3.25
Do not know	80	13.6			
Urethra	191	32.7	Disposal of sanitary pads	Number	Percentage
Uterus	313	53.59	Burn it	8	1.78
			Throw in routine waste wrapped	365	81.65
Reason for not using Disposablepads ($n = 137$)	Number	Percentage	Flush in toilet	3	0.67
Lack of knowledge	10	28.46			
High cost	84	9.41	First reaction to menstruation	Number	Percentage
Feel awkward/shyness	43	1.54	Fear	140	23.97
			Embarrassment	48	8.21
If using cloth, do you reuse it ($n = 118$)	Number	Percentage	Anxiety	316	54.1
Yes	35	29.66	Guilt	32	5.4
No	83	70.33	No reaction	48	8.21
How often is the absorbent changed in a day	Number	Percentage	Do you feel dirty during menstruation	Number	Percentage
Once	31	5.30	Yes	458	78.42
Twice	305	52.22	No	126	21.57
Thrice	192	32.87			
More than 3 times	56	9.58			
Whom are you comfortable discussing menstrual issues with	Number	Percentage	Do you think men will become sick if menstruating women touch them	Number	Percentage
Mother	315	53.93	Yes	117	20.03
Sister	98	16.78	No	409	70.03
Friend	73	1.25	Do not know	46	7.87
Teacher	18	3.08			
Husband	20	3.42			

Table 4 Acceptability of reusable sanitary napkins (Phases 1and 2 combined)

	N = 364	*Percentage*
Were the reusable sanitary napkins comfortable		
Yes	293	80.49
No	71	19.50
Reasons for discomfort		
Rashes	11	3.02
Slippage &soiling of clothes	33	9.06
Bad odor	1	0.27
Did not soak like disposable napkins	26	7.14
Did you have difficulty in cleaning them		
Yes	51	14.01
No	313	85.98
Did you have problems in drying		
Yes	44	12.08
No	320	87.91
Were the napkins comfortable after usage		
Yes	309	84.89
No	55	15.1
Would you recommend them to others		
Yes	301	82.69
No	63	17.3

drying out area for 2–3 houses. So, they either dried them inside their houses or covered them with other clothes to hide them. The average time of drying of the pads was about 4–6 h as told by 84% of the women. In total, 83.6% women said that they would recommend reusable napkins for use to others. (Table 4).

Discussion

Menstruation is a topic less talked about due to the associated stigma created by people across the society. Choice of menstrual absorbent should be a personal decision, but in promoting disposable sanitary napkins free of cost to school girls as a part of government schemes and by reducing the tax on them, we are promoting a biohazard. The disposable sanitary napkins not only contain plastic sheets to provide protection from leakage but may also contain chlorine-bleached wood pulp which has dioxin-like compounds (categorized as group 1 carcinogens by IARC) and volatile organic compounds that are reproductive and developmental toxins. All these chemicals are hazardous to the environment as they kill the microflora and delay the decomposition process.[10] There are336 million menstruating women in India and ∼121 million of them are using disposable sanitary napkins that would require about 500–800 years to decompose.[11]

Main finding of the study and comparison with similar articles

Only 26% women in our study had awareness about menstruation before attaining menarche and this is in accordance with other studies.[12,13] Khatuja *et al*.[14] in their study of adolescents in the urban slums of Delhi found higher rates of awareness (48%). It is assumed that the mother is the first person to discuss the topic of menstruation with her daughter at menarche and the same was reflected in our study. This was similar to the results obtained in various other studies.[12,13] Teachers were found to play an insignificant role in imparting menstrual education to the girls (12.67%), which is comparable to other studies.[15,16]

A very concerning observation made was that more than half of our study group 64.3% did not know about the cause of menstruation, and only 35.6% knew that menstruation is a physiological event. Even further dismal results were seen in studies conducted by Subhash *et al*. [13] and Juyal *et al*.[17] who reported that only 18.35% and 11.5% respondents, respectively, knew that menstruation was physiological. In spite of 'education for all' initiatives, it has been observed that especially in co-education schools, teachers generally skip this chapter and the children are asked to study it on their own so as to avoid discussions on the topic.

The word menstruation is synonymous with many myths and taboos. In the present study, restrictions during menstruation in the form of not being allowed to perform religious activities or to cook were most common. Subhash *et al*.[13] in his study found 74.7% women restricting themselves from religious activities and 33.6% were not being allowed to touch food. Wagh *et al*.[18] reported 96% girls avoided going to the temple, 68% girls restricted their daily activities and 50% girls avoided going to a kitchen during periods.

Disposable sanitary pads were the most common absorbent material used by 76.5% of the study group. The use of disposable napkins has seen a significant rise probably due to promotion of the disposable napkins as a single solution to all menstrual problems and the involvement of celebrities to advertise it. In a study by Dasgupta *et al*.[19], in rural West Bengal in 2008, only 11.2% girls used disposable napkins which increased to 71.2% in another study[20] done in a similar rural setting in 2014 thus reflecting the change in menstrual habits of the young girls over 6 years. Of the 447 women using disposable pads in our study, 15.8% women were disposing used pads unwrapped in the garbage. Similar results were seen in the study by Wagh *et al*.[18] where 12% girls threw used pads on the roadside. This does not only make the environment dirty but also is an environmental biohazard for sanitation workers handling them. At present, there is no policy to define soiled absorbents as hazardous solid waste because of the plastic in them or as biomedical waste due to the presence of blood and body fluids. MHM in India has not been able to address the problem of waste disposal.

What this study adds

Reusable sanitary napkins are washable pads that are not only cost-effective but also an eco-friendly sustainable option. Reluctance in the use of reusable pads is mainly due to suspicion of them being a source of genital infection. In the first phase of the present study, 95.2% of the study group did not show growth of any pathological organisms in the vaginal swabs after using reusable napkins for 2 months. These results were contradictory to the study conducted by Das *et al*.[15] who reported two times increased risk of urogenital infections in women using reusable napkins, but his study population mainly belonged to the tribal areas of Odisha, where adequate availability of water and separate toilet facilities may not have been available.

The feedback questionnaire regarding reusable sanitary napkins suggested a good acceptance of this product even in the population where >70% were used to the disposable sanitary napkins. In total, 80.4% women found the reusable napkins comfortable to use and 83.7% were ready to recommend them for use to others also. Hennegan[21] in a cross-sectional evaluation of reusable sanitary napkins in Uganda also found favorable acceptance. Budhathoki *et al*.[22] in a study done after the Nepal earthquake in 2015 reported reusable sanitary towels very well accepted by women.

One of the major challenges faced in achieving optimal menstrual hygiene is the availability of clean absorbents and their disposal. This obstacle can be overcome through the use of reusable sanitary napkins that are not only cost-effective but also free of plastics and environment-friendly.

The study reflects that women are open to available options and are ready to accept the change and what is good for them. Even though only I out of 5 may have followed up, but ~80% of women were willing to use the reusable pads and even recommend it to others. Thus what our women need is a basket approach, with all possible options being explained to them and letting them make the final informed decision.

Limitations of the study

In total, 36.7% of women in the study group were lost to follow-up. The demographic area of the study is home to a large proportion of the migrant population who in the wake of an upcoming pandemic of Covid-19 may have migrated to their home towns or villages.

In total, 80% of the women who came for follow-up found the reusable pads comfortable. Assuming that all the women who did not come for follow-up did not like the pad, still, approximately half the study group would be satisfied with these pads. This shows that a significant number of women are agreeable to a change of mindset which is centuries old. Further studies with more number of participants and better follow-up would help a clearer picture to emerge.

We recruited women from the community in phase 2 of the study. Recruitment of a complete study group from the OPD of our institute may have given better follow-up results.

The study was a subjective assessment of women's perception of new menstrual absorbent.

Conclusion

MHM is a 'red alert' situation and it is time that we recognize the right of women to hygienically manage their menstruation. This requires a change in the mindset of society regarding menstruation and its associated issues. We need to remember that though 'menstruation is a natural process but generating tons of unnatural waste is not.' Reusable sanitary pads are an effective alternative to disposable napkins in not only being more cost-effective but also in helping our environment to recover from the damage done by plastic-coated disposable napkins and provide the new woman with menstrual absorbents that do not hurt her or her world.

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