
ORIGINAL ARTICLE**Knowledge and Practices Related to Menstrual Waste Disposal Among College Going Adolescent Girls in an Urban Area**

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Abstract:**Background:**

Menstrual waste disposal has become an increasing problem in India due to lack of awareness about appropriate waste disposal. With rapid urbanization there is increased use of sanitary pads, including non-biodegradable menstrual products which are neither properly segregated nor properly disposed. Adolescents are future women, so there is need to study their current methods and knowledge about disposal of menstrual waste, as menstruation is being treated unclean in Indian society and issue continues to be brushed under the carpet.

Objective:

To study the knowledge and practices regarding menstrual waste disposal among adolescent girls.

Methods:

A community based cross-sectional study was conducted during June 2019 to December 2019 among 396 college going adolescent girls in the Latur city of Maharashtra State. Study individuals consisted of 396 adolescent girls of 11th and 12th grade and first year graduates who were randomly selected from four colleges in the city. A predesigned questionnaire was administered to collect the data regarding menstrual waste disposal methods used by the adolescent girls.

Results:

Among 396 adolescent girls, majority (95.96%) of participants were between 17-19 years. 352 (88.89%) girls used sanitary pads while 25 girls used

cotton. 33.08% girls disposed the menstrual waste in household refuse and only 43 girls used incinerator for disposal. Out of 396 study participants, 302 (76.26%) mentioned that menstrual waste should be disposed along with household waste and 55.56% were not aware of the menstrual hygiene management programme.

Conclusion:

Majority of the adolescent girls were not aware of appropriate disposal of menstrual waste and hence disposed it inappropriately.

Key Words:

Menstrual waste disposal practices, Adolescent girls, Urban area.

Introduction:

According to WHO, the age group between 10-19 years is considered as adolescents, usually menarche is attained by 12-13 years of age¹. A woman menstruates approximately 459 times during in her life from puberty to menopause². Approximately 125 to 150 kgs of tampons, pads and applicators are disposed during this period. A large part of this waste end up in landfills or waste water system³. Traditionally cloth was used as an absorbent material during menstruation. However due to increasing awareness, urbanization, rising incomes and expanded product availability there is a gradual shift to sanitary pads⁴. Many studies have shown that for adolescent girls, their mother is the prime source of information about menstrual hygiene and waste disposal along with teachers, friends,

television, relatives and newspapers, magazines. But the information they receive from these sources might not be enough or partial leading to lack of knowledge regarding safe and appropriate disposal of menstrual waste^{5, 6, 7}.

Commercial pads are usually made of top sheet of perforated non-woven fabric of polypropylene/polythene; emollient-petrolatum based formulation and an absorbent core with polymeric open celled foam⁸. These materials have a clean surface, high absorption capacity, clean surface and provide comfort to skin with fragrance^{9, 10}. However they cannot be disposed using pit burning, deep burial, composting or routine incinerators. These materials should be incinerated in a biomedical waste incinerator¹¹.

As per Menstrual hygiene Alliance of India, there are 336 million menstruating women in India of which approximately 121 million (36%) women use disposable sanitary napkins. Thus, a total of 12.3 billion disposable sanitary napkins are generated every year that need appropriate disposal¹².

Solid Waste Management rules 2016 considers all solid napkins, diapers, condoms, tampons, blood-soaked cotton as house hold waste are required to be properly segregated into biodegradable and non-biodegradable waste. However according to biomedical waste management rules all the items contaminated with blood and body fluids should be treated as bio-medical waste and incinerated, autoclaved or microwaved.¹¹ According to Rule no.7, manufacturers or branded companies of sanitary pads and diapers should look into all the possible ways to recycle them or dispose them appropriately by providing a pouch or wrapper for each napkin. They are also required to educate the people regarding proper way of disposal.

Access to safe menstrual hygiene management material is a fundamental need for adolescent girls. Public institutions such as schools, colleges, hostels and government building usually lack appropriate

mechanisms for disposal of menstrual waste^{12, 13, 14}. In urban areas menstrual waste materials are flushed in toilets or left unwrapped or wrapped in the toilet corners, clogging the sewer pipelines causing backflow of system. Blockage of sewage system is a global problem and in India clogged drainage usually unblocked and cleaned manually by conservancy workers without proper protection, exposing them to pathogens¹.

In rural areas burning, burying, throwing in garbage or pit latrines is quite common. Some types of sanitary pads contain organochlorines, chemicals which may disturb soil microflora, when buried in the soil. People living along the riverbanks throw menstrual wastes into water bodies thereby indiscriminately contaminating them¹⁵.

There are several studies on knowledge regarding menstrual hygiene but we could not find any published study regarding practices of menstrual waste disposal from India. Adolescence is an important phase in a girl's life and requires special attention as it is earmarked with onset of menarche¹³. When a girl attains menarche; she needs information on the biology of menstruation and skills to manage her menstrual cycle privately. Menstrual hygiene management training should also include education on proper use and safe disposal of menstrual waste materials. There is a substantial lacuna regarding awareness toward menstrual waste disposal methods among adolescent girls who provide only partial information. Socio economic status, education of the mother also plays an important role^{16, 17}. To accomplish this, studies need to be done to know the current practices of disposal and their knowledge about handling menstrual waste, which may help in planning need-based awareness campaigns regarding, segregation, and appropriate ways to dispose them without endangering environment. With this background in mind this cross sectional study was conducted to determine the knowledge and practices regarding menstrual waste disposal among college going adolescent girls.

Material and Methods:**Study design, population and setting:**

The present cross sectional study was conducted during June 2019 to December 2019 among 396 college going adolescent girls from selected colleges from an urban area. The ethical approval was obtained from the institutional ethics committee.

Sampling method:

A pilot study was conducted among 101 girls to know proportion of appropriate menstrual waste disposal practices among these girls which was found to be 49.5%. The same proportion was used to calculate the sample size with the help of formula $n = 4pq/l^2$. Sample size was 392 with 10% precision of p. All the colleges in the urban area were enlisted and four colleges were randomly selected. The adolescent girls were selected randomly till the desired sample size was achieved.

Inclusion and exclusion criteria:

Adolescent girls who attained menarche and willing to participate in the study were selected while those who were absent on the day of data collection or not willing to participate were excluded.

Data collection:

A total of 396 students were included in the study after taking permission from the principal of the college, the class teachers of the 11th, 12th and first year degree class. They were explained the purpose of the study, a rapport was developed with the students in the classroom and they were requested to participate in this study. Verbal as well as written consent was obtained and they were assured about the confidentiality of their personal data. Predesigned and pretested proforma was distributed to be filled by them and asked to return to the principal investigator. The first part of the proforma included the sociodemographic information like name, age, family details, education, and occupation of parents in particular of the mother. Second part included

information related to menstruation like duration, hygienic practices, the type of sanitary material used and the routine practice of menstrual waste disposal. It also included questions related to the use of best sanitary material, most appropriate method of disposal and source of information.

Statistical analysis:

The data was filled in excel sheet and analyzed using Microsoft excel and EPI – info software version 7.2.2.6 with frequency and percentages.

Results:

Table No. 1 shows the sociodemographic characteristics of the study participants. Most of the girls (95.96%) belonged to 17 to 19 years of age. Two twelve (53.54%) were from joint family and maximum i.e., 171 (43.18%) belonged to class I socioeconomic class. Out of 396 girls, 69.95% were residing in hostel and 64.9% had attained menarche at 13 to 14 years of age.

It was observed that 352 (88.89%) of college going adolescent girls in the study used sanitary pads and 25(6.31%) used cotton during menstruation. Other materials used were cloth, tissue paper or menstrual cup (Table No. 2).

Table 3 shows menstrual waste disposal methods used by adolescent girls. There were multiple responses from the participants. About 33.08% girls reported that they wrapped the waste in a paper and throw in household waste followed 162 (20.61%) who wrapped it in plastic and discarded in household waste. Only 79 (10.05%) girls segregate this waste in separate bins. Seventy-five (9.54%) participants reported discarding waste directly in to household waste and 5.47% flushed it into the toilet.

Out of 396 girls, 43 (10.86%) used incinerator for menstrual waste disposal. Of these 43 girls, 33(76.74%) used it at hostel while other used it either at school or college or a public toilet. (Table No. 4)

It was observed that 181(45.71%) adolescent girls preferred purchasing cotton pads, 24.75% used gel

pads and 17.42% used ultrathin pads/superabsorbent pads.

The knowledge of appropriate disposal was also tested among these adolescent girls.

According to 302 (76.26%) girls the most appropriate method of disposal of menstrual waste is disposing it in household waste after wrapping it in paper or plastic. 185 (46.72%) told that this waste should be incinerated while 89 (22.47%) mentioned that it should be segregated in separate bins and disposed separately. According to 45 (11.36%) girls it was safe to dispose with household waste directly and 12.37%

were in favor of burying it. (Table No. 5)

Table No. 6 shows that out of 396 adolescent girls 186 (46.97%) told that they don't know whether segregation of this type of waste is necessary whereas 55 (13.89%) were aware of waste segregation. It was satisfactory to know that 286 (72.22%) girls knew that there are special incinerators for menstrual waste disposal. Most of these girls i.e. 369 (93.18%) agreed that inappropriate disposal of menstrual waste may be hazardous to environment, human beings and animals. Two hundred twenty (55.56%) girls were not aware of Menstrual Hygiene Management Programme.

Table No.1: Sociodemographic Profile of adolescent girls

Sr. No.	Sociodemographic Factors	Frequency (N=396)	Percentage
1	Age		
	14 to 16	16	4.04
	17 to 19	380	95.96
2	Type of family		
	Nuclear	184	46.46
	Joint	212	53.54
3	Socioeconomic status		
	Class I	171	43.18
	Class II	99	25.00
	Class III	63	15.91
	Class IV	32	8.08
	Class V	31	7.83
4	Place of permanent Residence		
	Home	108	27.27
	Hostel	277	69.95
	With Relatives	11	2.78
5	Age at menarche		
	11 to 12	23	5.81
	13 to 14	257	64.90
	15 to 16	116	29.29

Table No.2: Menstrual hygiene material used by adolescent girls

Sr. No.	Material used	Frequency	Percentage
1	Sanitary Pad	352	88.89
2	Cotton	25	6.31
3	Cloth	14	3.54
4	Tissue paper	3	0.76
5	Menstrual Cup	2	0.51
Total		396	100

Table No.3: Disposal methods for menstrual waste followed by adolescent girls

Sr. No.	Material used	Frequency	Percentage
1	Thrown in the household refuse directly	75	9.54
2	Wrapped in paper and thrown in the household refuse	260	33.08
3	Wrapped in plastic and thrown in the household refuse	162	20.61
4	Flushed into toilet	43	5.47
5	Into separate bins	79	10.05
6	Incinerators placed in bathroom	43	5.09
7	Thrown into open spaces	24	3.05
8	Burnt	73	9.29
9	Buried	27	3.44
10	Other	03	0.38
Total		786*	

*Multiple responses

Table No.4: Distribution of adolescent girls according to the use of incinerator

Sr. No.	Use of incinerator	Frequency	Percentage
1	No	353	89.14
2	Yes		
	- At hostel	33	
	-At school or college	05	10.86
	-In public toilet	05	
Total		396	100

Table No.5: Knowledge of menstrual waste disposal among participants

Sr. No.	Material used	Frequency	Percentage
1	Safe to dispose with household waste directly	45	11.36
2	Should be wrapped in paper or plastic bag before disposing in household waste	302	76.26
3	Should be flushed into toilet	17	4.29
4	Should be segregated in separate bins	89	22.47
5	Should be incinerated	185	46.72
6	Thrown into open spaces	14	3.54
7	Should be Buried	49	12.37
Total		701*	

*Multiple response

Table No.6: Knowledge of menstrual waste segregation and disposal

Sr. No.	Question asked (n=396)	Yes	No	Don't Know
1	Is segregation of menstrual waste necessary?	55 (13.89%)	155 (39.14%)	186 (46.97%)
2	Is there Special incinerator for menstrual waste disposal?	286 (72.22%)	110 (27.78%)	-
3	Is inappropriate disposal hazardous to environment, human beings and animals?	369 (93.18%)	19 (4.80%)	08 (2.02%)
4	Aware regarding Menstrual Hygiene Management programme?	176 (44.44%)	220 (55.56%)	-

Discussion:

The present cross-sectional study was conducted to assess knowledge and practices related to menstrual waste disposal among adolescent college girls in an urban area. The growing use of sanitary pads among reproductive age group calls for knowledge and facilities for their appropriate disposal. As this knowledge among adolescent girls will help to prevent or control the environmental pollution and address the health hazards associated with it^{1,12,18}.

In the present study most of the adolescent college going girls were in the age group of 17-19yrs, belonged to joint family with class I socioeconomic status, staying in hostel and most of them attained menarche by the age of 13 to 14yrs (64.90%), similar

observations were made by Subash B. Thakre et al⁵ with majority of girls attaining maturity by the age 13(47.03%) and 14(16.8%) years. Another study by Amrita Bagga et al¹⁹ from Maharashtra reported 63.30% girls attaining menarche between 12-14years. Current study showed that about 88.89% of adolescent girls were using sanitary pads, 6.31% were using cotton while 3.54% used cloth and remaining used either tissue paper or menstrual cups. Similar findings were observed in a study conducted by Gunjan Kumar et al²⁰ in south west Delhi where 91.3% reported using sanitary pads. In a study conducted in Haryana by Rakhi Jain et al⁸ among adolescent girls, 78.72% used sanitary pads and 21.28% used cloth. Divya Raina et

al²¹ conducted a study in Dehradun, Uttarakhand shown contrary findings with only 59.33% using sanitary pad and 40.67% using cloth. Contrasting results were also observed in another study done by Abhay Bhausaheb Mudey et al²² in rural parts of Wardha district where 65.70% of adolescent girls used cloth and 12.30% used sanitary pads. Drakshayani Devi et al²³ did a study in Guntur district of Andhra Pradesh among rural adolescent girls found that 98.46% used cloth and remarkably less number used pads. A study by Adhkari P et al²⁴ in Chitwan district of Nepal (urban area) showed that 94% uses sanitary pads. These differences may be because of different geographical area of study i.e., rural areas, as the current study was conducted in urban area. Studies done in urban area showing similar results and studies done in rural area showing contrary results.

Out of 25 girls who were using cloth, 80% of them were reusing it. Similar findings were observed in study done by Subhash B Thakre et al⁵ in Soaner, Nagpur district where 91.15% girls reused cloth pieces¹⁴. Rakhi Jain et al⁸ in Haryana found that 60.08% girls reused cloth. Contrasting results were observed in study done by Gunjankumar et al²⁰ in south west Delhi, an urban area where only 12.4% reused cloth. A study done by Drakshayani Devi et al²³ in AP showed that only 39.06% were reusing cloth. The differences may be due to geographical area of study and knowledge among that community.

Present study showed that 53.69% girls wrapped menstrual waste either in plastic or paper and discarded it into household refuse and around 9.54% dropped the sanitary waste directly into household refuse. Only 5.09% used incinerators. Similar findings were observed in study by Abhay Bhausaheb Mudey et al²² in Wardha district who found that 55.67% throw used pads in dust bins. In a study done by Subhash B. Thakre et al⁵ in Soaner, Nagpur district where 45.23% sanitary waste was thrown in routine household refuse. Arundhati Muralidharan¹² in her study about management of menstrual waste reported that 28% used sanitary pads go in routine waste, 28% were

thrown in open, 33% were buried and 15% were disposed by open burning. Contrasting results were seen in a study conducted by Divya Raina et al²¹ in Dehradun Uttarakhand, who observed that 56% burnt the waste, 16% disposed in household refuse. The difference might be due to geographic variation, the knowledge they got from different sources and also facilities available.

The present study was conducted to see the extent of knowledge among the adolescent college girls as they will be future mothers who will be major source of information regarding menstrual hygiene, practices and waste disposal^{5,20,22}. It was observed that 89.14% had never used incinerator and 10.86% used incinerator in their colleges. The guidelines in MHM clearly mention the installment of incinerators in schools and colleges by utilizing funds from NBA, SSA and other ministries. The present study also showed that 72.22% knew that incinerators are to be used for sanitary waste disposal whereas 27.78% were not aware about the use of incinerators. There is a need to educate the adolescent girls about appropriate disposal of menstrual waste as stated in guidelines of MHM^{15,26}. About 45.71% preferred cotton pads, 24.75% gel pads. Three hundred two i.e., 76.26% of the girls under study thought that the menstrual waste is to be wrapped in paper or plastic and to be dropped in household refuse, but a good percentage of about 46.72% mentioned that sanitary pads should be incinerated. Out of 396 girls, 46.97% told that they don't know whether segregation of menstrual waste is necessary while 39.14% mentioned that there is no need of segregation which states the need to address this issue. Rajanbir Kaur et al¹ in his study stated that menstrual waste should not be disposed along with domestic waste. Most of the girls i.e. 93.18% knew that menstrual waste is hazardous as per the current study. Only 44.44% knew about the MHM programme, which includes guidelines for free, distribution of sanitary pads, to conduct IEC among adolescents regarding menstrual hygiene and menstrual waste disposal¹⁵.

Conclusions:

The present study found that a good number of adolescent girls were using sanitary pads but their knowledge regarding menstrual waste disposal was not satisfactory. The practices they were following for disposal were not appropriate; waste was not segregated and most of it was disposed along with the household refuse. Current study also pointed out lack facilities for segregation and disposal which need to be addressed by providing essential information on appropriate segregation and disposal, also looking into building up facilities like incinerators in schools and colleges.

Conflict of Interest - Nil

Sources of Support - Nil

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