

## **Factors influencing hygienic practices during menses among girls from south India- A cross sectional study**

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## **Factors influencing hygienic practices during menses among girls from south India- A cross sectional study**

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### **Abstract**

**Background:** Menstruation is a natural phenomenon among matured females who experience shedding of blood for 1-7 days every month from the age of maturity until menopause. Menstrual hygiene and management is an issue that is insufficiently acknowledged and has not received adequate attention.

**Aims and Objectives:** This study seeks to assess hygienic behavior of unmarried females aged 15 to 22 years and factors affecting their behaviors.

**Study Design:** A cross-sectional study was conducted during 2009-10 on 350 students. They were recruited from educational institutions from a major city in South India. Demographic and menstrual history and hygiene questionnaires were used for obtaining required information. Statistical Packages for the Social Sciences (SPSS) for Windows version 16 was used. Descriptive statistics, Chi-sq and Fisher's exact tests were used for analysis.

**Results:** Mean age of menarche was  $13.4 \pm 1.2$  years; disposable pads were used by two-thirds of the selected girls (68.9%) regardless of age while 45.1% reported to use both disposable and non disposable materials. Frequency of changing pads was 2-3 times a day by 78.3% girls. Socioeconomic Status (SES) of the selected girls and their age influenced choice of napkin/pads and other practices such as storage place of napkins; change during night and during school or college hours and personal hygiene. Older girls had better hygienic practices than the younger ones. Seventy six percent of the participants desired for more information regarding menstruation and hygienic practices.

**Conclusion:** A variety of factors are known to affect menstrual behaviors most influential being age and SES. Awareness regarding the need for information about healthy menstrual practices is on rise among young women. It is probable that a mechanism be introduced to provide knowledge about menstrual health and self maintenance among women.

**Keywords:** Menarche age, Menstruation, Menstrual absorbents, Menstrual hygiene, Practices, Girls, South India

## **Introduction**

Menstruation is a natural phenomenon among matured females who experience shedding of blood for 1-7 days every month from the age of maturity until menopause<sup>[1]</sup>. Various aspects such as physiology, pathology and psychology of menstruation have been found to associate with health and wellbeing of women; hence it is an important issue concerning morbidity and mortality of female population. On the other hand, hygiene-related practices during menstruation are of considerable importance for reproductive health, poor practices increase vulnerability to reproductive tract Infections<sup>[2]</sup>.

Good hygiene, such as use of sanitary pads and adequate washing of the genital area, is essential during menstruation. Women and girls of reproductive age need access to clean and soft absorbent sanitary products, which in the long run protect their health<sup>[3-4]</sup>. Menstrual hygiene and management is an issue that is insufficiently acknowledged and has not received adequate attention.

Adolescent girls constitute a vulnerable group not only with respect to their social status but also in relation to health. Menstruation is regarded as unclean or dirty in Indian society. Although it is a natural process, is linked with several misconceptions and practices which sometimes results into adverse health outcomes. Never the less, reaction to menstruation depends upon awareness and knowledge about the subject. The manner in which a girl learns about menstruation and its associated changes may have an impact on her attitude to the event of menarche<sup>[2]</sup>.

Primarily poor personal hygiene and unsafe sanitary conditions result in gynecological problems<sup>[5]</sup>. Infections due to lack of hygiene during menstruation are often reported<sup>[6-7]</sup>. Repeated use of unclean napkins or the improperly dried cloth napkins before its reuse results in harboring of micro-organisms causing vaginal infections<sup>[8]</sup>. Very few studies have included the detailed aspects of menstrual practices prevalent among young girls. It was therefore considered relevant to investigate menstrual related practices among females aged 15-22 years from South India.

## **Methods and materials**

The study was conducted during the academic years 2009 – 2010. A cross-sectional study was carried out on 350 students recruited from educational institutions offering higher secondary education, pre-university and under graduate courses in the urban areas from a major city in South India. A purposeful sampling was done to select girls who were unmarried and in the age group of 15-22 years. Also those who volunteered to give complete and correct information were included for the study. The selected women were explained about the protocol and purpose of the study and were requested to complete the questionnaires to elicit information relating to demographic features, menarche age and menstrual hygiene and practices.

The demographic information included family details relating to family size, type, parent's education, occupation, house type, and possession of costly goods like vehicles, computer, TV, DVD, refrigerator, phones etc., and the information was used to derive the socio economic status. The chronological age and age at menarche was also elicited.

Menstrual hygiene questionnaire included queries about type of napkins used, storage place, usage of napkins such as clean and unclean napkins, frequency of change and cleaning. Information about personal hygiene included, washing and bathing during menses, practice of wearing stained clothes etc. The research protocol was approved by the Ethical Committee, University of Mysore.

### *Statistical analysis*

The data was analyzed using SPSS for Windows version 16. Descriptive statistics was used to determine mean and percentages. The categorical data were analyzed using Chi-sq or Fisher's exact test and regression analysis.

## **Results**

Table 1 presents the demographic details of the selected girls. It is evident that the mean age of the subjects studied was  $18.6 \pm 1.7$  years, while the age range was 15 - 22 years. Among these 42.6 % girls were in the age group of 15-19 years, and others were aged 19-22 years (57.4%). Age at menarche in the selected group ranged from 10-17 years, with a mean of  $13.4 \pm 1.2$  years. Majority of the participants (90.9%) belonged to families practicing Hinduism, 85.4% girls were from nuclear family. The girls belonged to low (20.8%), middle (49.1%) and high (11.7%) SES.

Table 2 presents data regarding the awareness about menstruation before encompassing menarche. It is evident that 64.2% of the participants were aware and the most important source of information was mothers, while friends and television also contributed to their information.

Table 3 highlights the pattern of use of sanitary napkins by girls according to age. It can be perceived that two-thirds of the selected girls (68.9%) regardless of age used disposable pads and a small proportion (7.4% and 19.1%) used cotton or cloth material, respectively. However use of both the disposable and non disposable materials by girls was also common. With respect to storage of the sanitary napkins and the pattern of use, it was found that 56.6% girls stored the clean (unused) pads in the cupboards or drawers, and 15.1 and 21.1% girls used dress cabinet and bathroom respectively. The practice of changing pads during night was mentioned by 79.1% while changing in school or college was less common (20.6%). Majority (78.3%) of the girls changed napkins 2-3 times a day and 16.6% mentioned to change once a day.

The hygienic practices were different in girls aged 19 years and above as compared to younger ages. We found significant association between type of napkin/pads used and the age ( $P=0.001$ ) of the participants, higher proportion of older girls used disposable pads than the young girls. Since significant associations were also found between age and practice of storage ( $P=0.002$ ), change of pads during nights ( $P=0.018$ ); number of pads used per day ( $P=0.045$ ) and reuse of pads ( $P=0.014$ ).

Table 4 presents information regarding personal hygiene. Practice of bathing ( $P=0.049$ ) during menstruation, using washed napkins ( $P=0.009$ ) and wearing stained dress ( $P=0.001$ ) were significantly associated to age. Significantly higher percent of older girls (87.2%) practiced bathing as compared to younger age (79.3%). Nearly 83% of the girls studied regardless of age mentioned to practice washing of genital tract. Other practices such as using washed napkins and wearing stained dress were noted among younger girls in higher percentage. Majority of the participants opined the need for more information regarding menstruation and hygienic practices to be followed during these days.

Table 5 provides information about relationship between menarche age and various menstrual practices. A partial correlation that was performed by adjusting chronological age to identify the effect of menarche age, however, no significant relationship was observed for any of the practices studied.

Table 6 exhibits statistically significant association between SES and practices such as use of disposable pads ( $P=0.004$ ), storage behavior ( $P=0.049$ ), wearing stained dresses ( $P=0.004$ ) and expressing the need for information about menstruation ( $P=0.027$ ).

Table 7 the linear regression analysis revealed a significant negative effect of SES on Menarche age, Awareness about menstruation and use of non disposable pads.

## **Discussion**

Hygiene related practices of women during menstruation are of considerable importance as it affects health by increasing vulnerability to infection especially the infections of urinary tract and perineum. Studies reported from India and other developing countries have highlighted the common practices prevailing among the young females<sup>[2, 9]</sup>. The type of absorbent material used is of primary concern since reusable material could be a cause for infection if improperly cleaned and poorly stored<sup>[9]</sup>. Studies from India and Pakistan indicate use of old cloth material as a frequently used absorbent (98.5%) among both rural and urban girls<sup>[10-12]</sup>.

A study from India, reported that majority of rural school girls who used old cloth, sanitize the materials by boiling and drying them before reuse. It is evident that such practices offer protection against possible infections. In our study 19.1% girls used cloth material as menstrual absorbents never the less practice of cleaning or sanitizing was not appraised. Place of storage of pads/ napkins is equally important for their cleanliness, especially practice of storing in bath rooms is disturbing since it could

give rise to harboring of dust and insects. The proportion of participants having bathroom as storage place was 21. 1%, this practice was significantly prevalent among younger age. In other studies practice of storing in bath room was as high as 49.8%. Literature information regarding the adverse health effect due to bath room storage is meager<sup>[11]</sup>.

According to healthy practices changing pads during night and at school or college is important. Change of napkins/ pads at an interval of 3–4 hours is considered as a healthy behavior for comfort and to prevent odor, regardless of the extent of staining<sup>[3]</sup>. Higher percentage of girls (80%) practiced to changing pads at night while a small proportion changed pads at school / college hours (20.6%).. Age profoundly influenced the practice of changing at night, significantly higher percentage of older girls practiced to change at night (Table 3). On the other hand, the practice of continued use of pads during school hours was a common behavior across all the age groups. It is obvious to expect health risk due to such practices .The probable reason for not changing the pads could be ignorance and lack of facility. Our findings are in accordance to other studies reported from India and Arabia Saudi<sup>[12]</sup>.

Further, the practice of reuse of soiled napkins was found common among girls in the present group; although the percentage was less, significantly higher proportion of younger girls used the soiled napkins. It could be because of lack of knowledge about healthy practices in young girls. Narayana et al. suggested based on his study that urban girls have better awareness about menstrual hygienic practices than their rural counterpart<sup>[11]</sup>.

Studies from India indicate that, ritualistically girls take special bath at the time of menstruation, hence 83.9% practiced taking bath and this behavior was found to be associated to age. Also a higher percentage of girls were aware of washing genital tracts and perineum which is essential for health. Attitudes such as refraining from bath and poor perineum care were found common among a small percentage of the participants. Bathing was significantly associated to age. Lack of awareness regarding the menstrual hygiene could be an important influencing factor for poor practices<sup>[12-14]</sup>. Similar observations have been reported by other studies from India. On the other hand none of these behaviors were associated to age of menarche<sup>[10]</sup>.

Socio economic status was the most influencing factor on the behavior of girls, it is established fact that affordability help to acquire healthful behaviors<sup>[15]</sup>. It is evident from our observations that, use of unsanitary and sub-standard menstrual absorbents was common among girls from low socio economic status. Therefore undoubtedly poverty and low social class play a major role on the choices of absorbents leading to the use of unsanitary materials. It is likely that poor financial resources has contributed to the use of ‘multiple material’ as menstrual absorbents; Gilany et al. working with Egyptian girls were also of similar opinion<sup>[9]</sup>. We found significant association between SES and factors such as kind of pads used, storage place and wearing stained dress. However, there was an inverse relation between SES and need for more information about menstrual practices. Other studies have shown lower socio-economic status, lack of access to information about menstruation and money to

buy sanitary products for menstrual hygiene are all related factors affecting menstrual behaviors<sup>[9, 16]</sup>. Evidently poverty is more than just the lack of income as it includes lack of access to services, resources and skills, vulnerability, insecurity and powerlessness<sup>[15]</sup>.

Prior awareness regarding menarche and menstruation among girls is generally low in most cultures. Never the less in our study 64.5% of the participants were aware<sup>[17-19]</sup>. Mothers, teachers, friends, relatives, television and books are reported as the major source of information. Considerable percentage (54 and 35.3% )of the participants revealed mothers followed by friends to be the source of information. Prior information about menstruation has been reported to prepare the girl child mentally to accept the change in a constructive way and help her to develop better attitude<sup>[19-20]</sup>.

## **Conclusion**

Healthy practices are important for health and well being of individuals. Menstrual period is one such time when females are expected to adopt hygienic practices. A variety of factors are known to affect the behaviors. Age, culture, awareness and SES are often found to exert profound influence on the behaviors and practices. Age and SES were the most influencing factors, as they influenced the choices for menstrual absorbents and other practices such as personal hygiene, bathing and washing of genital tract was common, changing of pads at night and school hours was followed by higher percentage of girls. Further, girls are becoming conscious about the importance of adopting healthy practices during menstrual period since majority of girls opined the need for menstrual health education. It is important therefore that a sustained public health awareness program is developed to operate in population to create better awareness among women. Such initiative would make women population self sufficient to manage their health and wellbeing.

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Table 1: Demographic profile of selected girls

<b>Participants</b>	<b>N</b>	<b>Percent</b>
≤19 Yrs adolescents	149	42.6
>19 Yrs young adults	201	57.4
Mean age (current) in Years	18.7± 1.757	
Menarche age- Mean (in years) Range (in years)	13.470 ± 1.234 10-17	
<b>Religion</b>		
Hindu	318	90.9
Muslim	20	5.7
Christian	8	2.3
Others	4	1.1
Total	350	100.0
<b>Family type</b>		
Nuclear	299	85.4
Joint	32	9.1
Extended	14	4.0
Total	345	98.6*
<b>Socio Economic Status</b>		
Low	73	20.8
Middle	172	49.1
High	41	11.7
Total	286	81.6*

\*Differences in percentages are due to non reporting.

Table 2: Awareness about menstruation among girls and sources of information

variable	N (%)
Girls aware about menses before menarche	217 (64.5)
<b>Source for information</b>	
Mother	116 (54.0)
Friends	76 (35.3)
Television	30 (14.0)
Magazines	8 (3.7)
News paper	6 (2.8)
others	10 (4.7)

Table 3: Usage of napkins during menses: type, storage and frequency of change

practice	variables		Percent of girls (n=350) N(%)	Age in years		Chi-sq
				< 19	>19	
Kinds of pads used	Disposable	Sanitary napkins	241 (68.9)	86 (57.7)	155(77.1)	0.426**
		Cotton	26 (7.4)	13( 8.7)	13( 6.5)	
	Non disposable	Cloth material	67( 19.1)	44 (29.5)	23(11.4)	0.760**
		Others	13(3.7)	5 (3.4)	8( 3.9)	
Storage Place for pads	Dress cabinets		53(15.1)	19( 12.8)	34(16.9)	0.283 <sup>Ns</sup>
	Cupboard/drawers		198(56.6)	76(51.1)	122( 60.7)	
	Bathroom		74(21.1)	43 (28.8)	31 (15.4)	0.949**
	Others		12(3.4)	5( 3.4)	7 (3.5)	
Number of pads per day	One		58(16.6)	33 (22.1)	25(12.4)	8.981*
	2-3		274(78.3)	109(73.2)	165(82.1)	
	>3		14(4.0)	4(2.7)	10(5.0)	
Changing pad during night	No		71(20.3)	39( 26.2)	32(15.9)	6.059*
	Yes		277 ( 79.1)	109(73.2)	168(83.6)	
Changing pads at school / college	No		78.6(275)	79.2 (118)	78.1 (157)	0.189 <sup>Ns</sup>
	Yes		20.6(72)	19.5(29)	36.3(73)	
Reuse of pads (Unclean)	No		94.0 (329)	136(91.3%)	193(96.1%)	5.353*
	Yes		4.3 (15)	11(7.4%)	4(1.9%)	

The difference in total percentage for each practice is due to 'no response' from subjects.

Table 4: Personal Hygienic practices during menstruation

Variables	Practice	Percent of girls (n=350)	Age in year		Chi-Sq
			< 19	>19	
Taking bath during their periods	No	16.1(55)	20.7 (30)	12.8 (25)	6.713**
	Yes	83.9(286)	79.3 (115)	87.2(171)	
Washing genital tract (at every visit to toilet)	No	14.3(50)	15.4(23)	13.4(27)	0.520 <sup>NS</sup>
	Yes	82.9(290)	81.9 (122)	83.6(168)	
Using washed napkins during periods	No	51.1(179)	42.0(64)	57.2(115)	8.944**
	Yes	42.0(147)	49.7(74)	36.3(73)	
Wearing stained dress	No	46.0(178)	41.6 (62)	57.7 (116)	11.567**
	Yes	50.9(161)	56.4(84)	38.3(77)	
Need more information about menstrual hygiene	No	18.6(65)	23.5(35)	14.9 (30)	4.646*
	Yes	78.3(274)	75.2(112)	80.6(162)	

P values are obtained by chi-square test

Table 5: Influence of age and menarche age on hygienic practices followed during menses by the selected girls (%)

Practices			Age at the time of study					
			<19 yrs			>19 yrs		
			Menarche age (in yrs)					
			10-12 N(%)	13-14 N(%)	15-17 N(%)	10-12 N(%)	13-14 N(%)	15-17 N(%)
<b>Kind of pads</b>	Disposable	Sanitary napkins	20(55.5)	46(55.4)	14(70.0)	32(82.0)	78(78.0)	40(80.0)
		Cotton	3(8.3)	7(8.4)	2(10.0)	4(10.2)	5(5.0)	2(4.0)
	Non disposable	Cloth material	12(33.3)	28(33.7)	3(15.0)	2(5.1)	11(11.0)	8(16.0)
		Other	1(2.8)	2(2.4)	1(5.0)	1(2.6)	6(6.0)	0(0.0)
<b>Pad keeping behavior</b>								
Dress cabinets			9(25.0)	7(8.8)	4(20.0)	8(20.5)	16(16.3)	7(14.6)
Cupboard/drawers bath room			18(50.0)	42(52.5)	12(60)	27(69.2)	60(61.2)	32(66.7)
other			9(25.0)	29(36.2)	3(15.0)	1(2.6)	19(19.4)	9(18.7)
0(0.0)			0(0.0)	2(2.5)	1(5.0)	3(7.7)	3(3.0)	0(0.0)
<b>Number of pads/day</b>								
1			10(27.8)	17(20.4)	6(30.0)	6(15.4)	8(8.0)	8(15.6)
2-3			25(69.4)	63(76.0)	14(70.0)	33(84.6)	87(86.1)	39(76.5)
>3			1(2.8)	3(3.6)	0(0.0)	0(0.0)	6(5.9)	4(7.9)
<b>Re-use unclear pads</b>								
Yes			0(0.0)	10(12.0)	1(5.0)	1(2.6)	2(2.0)	0(0.0)
no			36(100.0)	74(88.0)	19(95.0)	37(97.4)	97(98.0)	50(100.0)
<b>Taking bath</b>								
Yes			29(80.5)	66(78.6)	13(76.5)	33(89.1)	93(93.0)	40(30.8)
no			7(19.4)	18(21.4)	4(23.5)	4(10.9)	7(7.0)	90(69.2)
<b>Washing genital tract</b>								
Yes			31(91.2)	70(83.3)	14(73.7)	35(92.1)	80(82.5)	45(90.0)
no			3(8.8)	14(16.7)	5(26.3)	3(7.9)	17(17.5)	5 (10.0)
<b>Wearing stained dresses</b>								
Yes			15(44.1)	50(59.5)	9(45.0)	9(24.3)	43(43.0)	21(44.7)
no			19(55.9)	34(40.5)	11(55.0)	28(75.7)	57(57.0)	26(55.3)
<b>Expressed the need for more information</b>								
Yes			28(77.8)	66(78.6)	14(73.7)	32(84.2)	85(86.7)	40(83.3)
No			8(22.2)	18(21.4)	5(26.3)	6(15.8)	13(13.3)	8(16.7)

Table 6: Influence of SES on hygienic practices followed during menses by the selected girls

<i>Hygiene practices</i>			<i>SES</i>			<i>Chi-Sq</i>
			<i>Low</i>	<i>Middle</i>	<i>High</i>	
<i>Kind of pads</i>	<i>Disposable</i>	<i>Sanitary</i>	40(56.3)	125(73)	37(90.2)	28.635**
		<i>napkins Cotton</i>	3(4.2)	14(8.2)	2(4.8)	
	<i>Non disposable</i>	<i>Cloth</i>	25(35.2)	23(13.4)	1(2.4)	
		<i>Other</i>	3(4.2)	9(5.2)	1(2.4)	
<i>Pad keeping behavior</i>						15.543*
<i>Dress cabinet</i>			3(4.3)	33(20.0)	7(17.0)	
<i>Special cupboard</i>			44(63.8)	97(58.8)	24(58.5)	
<i>In bath room</i>			21(30.4)	29(17.6)	7(17.0)	
<i>other</i>			1(1.4)	6(3.6)	3(7.3)	
<i>Number of pads/day</i>						5.537 <sup>Ns</sup>
<i>1</i>			9(12.7)	31(18.1)	6(14.7)	
<i>2-3</i>			60(84.5)	133(77.8)	33(80.4)	
<i>&gt;3</i>			2(2.8)	7(4.0)	2(4.9)	
<i>Re-use unclear pads</i>						4.457 <sup>Ns</sup>
<i>Yes</i>			6(8.4)	7(4.7)	0(0.0)	
<i>no</i>			65(91.6)	163(95.3)	41(100.0)	
<i>Taking bath during menstruation</i>						0.644 <sup>Ns</sup>
<i>Yes</i>			61(87.1)	138(83.1)	34(82.9)	
<i>no</i>			9(2.9)	28(6.9)	7(7.1)	
<i>Washing genital tract</i>						2.071 <sup>Ns</sup>
<i>Yes</i>			61(84.7)	147(89.6)	33(82.5)	
<i>no</i>			11(5.3)	17(0.4)	7(7.5)	
<i>Wearing stained dresses</i>						11.084**
<i>Yes</i>			41(59.4)	71(2.8)	11(7.5)	
<i>no</i>			28(40.6)	95(57.2)	29(72.5)	
<i>Expressed the need for more information</i>						7.208*
<i>Yes</i>			66(91.7)	131(79.9)	30(73.1)	
<i>no</i>			6(8.3)	33(21.1)	11(6.9)	

Table 7: Regression analysis between SES and certain variables

<b>variables</b>	<b><math>\beta</math></b>	<b>Adj.r<sup>2</sup></b>	<b>P</b>
<b>Menarche age</b>	-0.145	0.017	0.000
<b>Awareness about menstruation</b>	-0.108	0.008	0.000
<b>Using non disposable pads</b>	-0.288	0.080	0.000