

Prevalence and determinants of menstrual disorders and napkin usage among women in India using DLHS-4 data

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ABSTRACT

Introduction: Menstrual disorders and hygiene practices during the menstruation significantly affect the health of reproductive age-group women. **Methods:** The data from nationally representative survey, DLHS-4, was used. The outcome assessed were menstrual disorders and napkin usage. The predictor variables were socio-demographic characteristics such as age group, caste, religion, marital status, and education status; reproductive characteristics such as outcome of pregnancy, condom use, IUCD usage, and vaginal discharge. The descriptive analysis and logistic regression analysis were done on 1,70,632 women. **Results:** The most common problems experienced by women were pain (5.4%), irregular periods (4.2%), followed by frequent period, prolonged bleeding, no period, scanty bleeding, excessive bleeding, and intermenstrual bleeding. A large proportion (37%) women were using cloth during menstruation. The factors significantly associated with menstrual problems were age, 36-40 years (OR 1.26, P value <0.001), marriage before 18 years (OR 1.16, P value <0.001), no education (OR 1.24 P value <0.001), BPL card holders (OR 1.14, P value <0.001), non-users of sanitary napkin (OR 1.09, P value <0.001). The socio-demographic factors significantly associated with napkin usage were women with secondary education and higher (OR 3.52, P value <0.001), toilet use - using flush toilet (OR 1.97, P value <0.001), not possessing BPL card (OR 1.42, P value <0.001), marriage after the age of 18 years (OR 1.35, P value <0.001). The reproductive characteristics significantly associated with menstrual problems were history of spontaneous abortion (OR 1.79, P value <0.001), history of induced abortion (OR 2.29, P value <0.001), women never used condoms (OR 1.09, P value <0.001), ever used IUCD (OR 1.11, P value <0.001), history of abnormal vaginal discharge during last three months (OR 5.32, P value <0.001). **Conclusion:** The use of sanitary napkin should be promoted as it promotes dignity, and equality of women, apart from the public health aspect.

Keywords: DLHS 4, menstrual determinants, napkin usage

Introduction

As per census of India 2011, women in reproductive age group constitute a larger proportion (i.e. 25%) of total population. Menstruation, a universal physiological phenomenon for any female starts at the age of 11-15 years (menarche) for most of the women ends (menopause) by almost 45-50 years.^[1] A woman spends 1/5th portion of her reproductive life menstruating. A woman menstruates for nearly 1800 days, equivalent to 6 years in her entire lifetime. To this physiological phenomenon, lots of

myths and misconceptions are associated which adversely affects the health of women.^[2]

With blood loss amounting to approximately 80 ml/cycle, menstruation is still associated with taboos and misconceptions. To such a large extent that it even affects daily life, along with other dimensions of life such as education, religious beliefs and health issues.^[3]

With the onset of menstruation, reproductive health status and overall health status is predominantly governed by hygiene practices and menstruation related disorders. However, poor menstrual hygiene and menstrual disorders are poorly

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Received: 29-03-2019 Revised: 30-03-2019 Accepted: 15-04-2019

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_262_19

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How to cite this article: Nitika, Lohani P. Prevalence and determinants of menstrual disorders and napkin usage among women in India using DLHS-4 data. J Family Med Prim Care 2019;8:2106-11.

acknowledged problems in developing countries like India. To add to the plethora of problems, women generally have low access to the good quality sanitary napkins. Most of the women in rural areas use old clothes, which generally becomes a source of infection, leading to problems of RTI.^[4,5]

The studies concerning the menstruation among adolescents are abundant.^[6] In contrast, very few studies have highlighted the issue among women in reproductive age group. District Level Household Survey – 4 (DLHS - 4), a nationally representative survey conducted by International Institute of Population Sciences (IIPS), under Government of India, a rich and authentic source of data, collected information on menstruation related factors.

With this background, the present study was planned to study the prevalence of menstrual disorders, and unhygienic practices observed during menstruation among reproductive age-group women using a national representative survey. The objective of the study was to assess the prevalence of menstrual disorders, napkin usage, and the socio-demographic and reproductive characteristics influencing it.

Methods

DLHS-4, the fourth in series, was conducted in 2012-13. It was preceded by three rounds in the past, namely, DLHS-1 in 1998-99, DLHS-2 in 2002-03, and DLHS-3 in 2008-09. DLHS-4 was not conducted in Empowered Action Groups (EAG) states and in Assam, where Annual Health Survey (AHS) 2011-2012 was done. The DLHS-4 unit level data has been used for the analysis in this study. The data was released in December 2015 for 275 districts of 21 states and UTs. The DLHS survey was conducted with the main objective of providing database of reproductive and child health at district level in India.

A multi-stage stratified, probability proportional to size (PPS) with replacement was adopted in DLHS-4. Computer-assisted personal interview (CAPI) was used for data collection. For this, interviewers were provided with mini laptops with bilingual questionnaire (English and local language). The data collection was done using pre tested structured questionnaires. The information in DLHS-4 relates to 319,695 women.

Ethics statement: The proposal of DLHS was assessed and approved by IIPS, Mumbai Ethics Committee, in association with Ministry of Health and Family Welfare, India. The de-identified version of dataset is available for download upon requesting IIPS, Director. In this de-identified dataset, no participant could be identified and traced. Thus, ethical approval was not required for analysis of downloaded de-identified version of data.

Study population: The women section of DLHS-4 was used for this analysis. This section collected information on menstrual history and napkin usage among women.

Outcome/Dependent variables: The study considers two outcome variables: menstrual disorders and napkin usage.

Menstrual disorders: From the women, this information was obtained by asking the question, “During the last three months, did you have any menstruation related problems?” The women having the menstrual problems were asked the following question, “What are the problems you have had?”

Napkin usage: For this, information was obtained by asking the question, “Women use different methods of protection during menstrual period to prevent bloodstains from becoming evident. What do use for this?” The various option for this question were: cloth, locally prepared napkins, sanitary napkins, nothing and others. Many of the women were using both cloth and napkin. For this study, a new variable napkin use was created. The women using either sanitary napkin or locally-prepared napkin but not using the cloth, were assigned code “1” and those using only cloth or cloth with napkin were assigned code “0”.

Independent variables

The independent variables included:

1. **Socio-demographic characteristics:** The socio-demographic characteristics included were: age group of women (<20, 21-25, 26-30, 31-35, 36-40, 41-45, 46-50 years), age at marriage (<18 years, >18 years), caste (SC, ST, OBC, others), religion (Hindu, Muslim, Sikh, others), marital status (married, never married/gauna not performed, divorced/separated), BPL card holder (yes, no), education status of women (no education, primary, middle, secondary and higher), toilet facility (flush, pit, dry, open defecation and others).
2. **Reproductive characteristics:** The following reproductive characteristics were included: outcome of pregnancy (no abortion, spontaneous abortion, induced abortion), ever used condom (yes, no), ever used IUCD (yes, no), abnormal vaginal discharge during last three months (yes, no).

Inclusion criteria and exclusion criteria: For this study, we used women dataset. The exclusions of observations is shown in Figure 1. The analysis was done on 1,70,632 women.

Statistical analysis

The Stata 12.0 was used for analysis. We conducted analysis in the study in two different stages. First, we conducted descriptive analysis of menstrual disorders and napkin usage. Secondly, we conducted multivariate logistic regression to determine odds ratio. Only significant variables ($P < 0.05$) from univariate analysis were picked for multivariate analysis. We fitted two multivariate logistic regression models: 1) with background characteristics; and 2) with reproductive characteristics. A P value of <0.05 was considered significant. The proportions and 95% confidence intervals, were presented wherever appropriate.

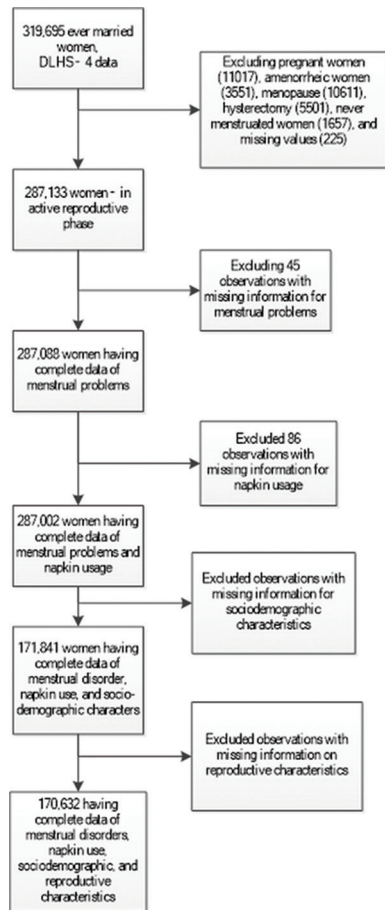


Figure 1: Flowchart depicting various exclusions for obtaining the complete data of 170,632 women

Results

Demographic profile of the respondent: The majority study participants were married, Hindu (71%), and age at marriage was more than 18 years (61.4%). Almost 1/3rd (30%) were BPL card holders. More than half of the study participants had completed their secondary level of education.

Nearly 1/10th (10.9%) of the women had menstrual problems. The problems experienced by the women were: painful periods (5.4%), irregular periods (4.2%), frequent/short periods (1.5%), prolonged bleeding (1.3%), no period (1.1%), scanty bleeding (0.8%), excessive bleeding (0.6%), and intermenstrual bleeding (0.3%).

The following materials were used during menstruation to prevent blood stains: only cloth (37.6%), only sanitary napkin (27.4%), only locally-prepared napkin (7.6%), and nothing (2.3%).

The prevalence of women with menstrual problems was highest in 36-40 years' age group, women married before 18 years, women with no education, using dry toilet, BPL card holders, married and those belonging to Sikh religion. [Table 1]

The proportion of women using sanitary napkin was highest in 26-30 years' age group, women married after 18 years, women with secondary education or higher, using flush toilets, women not having BPL card, never married women, and those belonging to Christian religion. [Table 1]

The major predictors of menstrual problems were women aged 36-40 years (OR 1.26, P value <0.001), women belonging to Sikh religion (OR 1.35, P value <0.001) marriage before 18 years (OR 1.16, P value <0.001), women with no education (OR 1.24 P value <0.001), women possessing BPL card (OR 1.14, P value <0.001), and women not using sanitary napkin (OR 1.09, P value <0.001). [Table 2]

The major predictors of sanitary napkin usage were women with secondary education and higher (OR 3.52, P value <0.001), women using flush toilet (OR 1.97, P value <0.001), women not possessing BPL card (OR 1.42, P value <0.001), married after the age of 18 years (OR 1.35, P value <0.001). The marital status was not significantly associated with sanitary napkin usage. [Table 3]

Table 4 shows the association between reproductive characteristics and menstrual problems. The categories significantly associated with menstrual problems were women with spontaneous abortion (OR 1.79, P value <0.001), history of induced abortion (OR 2.29, P value <0.001), women never used condoms (OR 1.09, P value <0.001), ever used IUCD (OR 1.11, P value <0.001), history of abnormal vaginal discharge during last three months (OR 5.32, P value <0.001).

Discussion

The DLHS-4 data for 1,70,632 women was used for this study for analyzing menstrual problems and napkin usage. The prevalence of menstrual problems was around 10% in this study. The use of unhygienic measures like cloth was quite high (37.6%).

A study conducted in rural Haryana among married women, found that one of every five women had menstrual problem. However, similar to our findings, the most common menstrual problem was pain.^[7] Likewise, a community based study conducted, in Ratnagiri district of Maharashtra, with 620 adolescent girls reported that majority of the study participants were having menstrual problem and 44.2% among them had dysmenorrhea.^[8]

The present study also emphasizes that the menstrual disorder was associated with socio- epidemiological profile of the women. The uneducated, poor, married women with history of early marriage, Sikh community and not using sanitary pads were associated with menstrual problems.

Another community-based study conducted in Nagpur compared urban and rural girls for menstrual problems and concluded that dysmenorrhea was reportedly higher among urban girls than rural girls. However, higher level of literacy status of mother

Table 1: Distribution of menstrual problems and napkin usage according to socio-demographic characteristics

Socio-demographic variable	n (%)	Women with menstrual problems n (%)	P	Women using Sanitary napkin n (%)	P
Age group (women)			<0.001		<0.001
<20 years	8,811 (5.2)	973 (11.0)		2,434 (27.6)	
21-25 years	28,859 (16.9)	2,793 (9.7)		8,411 (29.2)	
26-30 years	39,058 (22.9)	4,118 (10.5)		11,516 (29.5)	
31-35 years	33,717 (19.8)	3,813 (11.3)		9,475 (28.1)	
36-40 years	29,807 (17.4)	3,515 (11.8)		7,821 (26.2)	
41-45 years	20,495 (12.0)	2,402 (11.7)		4,883 (23.8)	
46-50 years	9,885 (5.8)	1,065 (10.8)		2,164 (21.9)	
Caste			<0.001		<0.001
SC	35,075 (20.6)	4,098 (11.7)		8,039 (22.9)	
ST	26,568 (15.6)	2,658 (10.0)		8,704 (32.8)	
OBC	63,038 (36.9)	6,649 (10.6)		17,484 (27.7)	
General	45,951 (26.9)	5,274 (11.5)		12,477 (27.2)	
Age of marriage			<0.001		<0.001
Before 18 years	65,889 (38.6)	8,078 (12.3)		13,529 (20.5)	
After 18 years	104,743 (61.4)	10,601 (10.1)		33,175 (31.7)	
Education status of women			<0.001		<0.001
No education	11,308 (6.6)	1,476 (13.1)		1,300 (11.5)	
Primary	27,797 (16.3)	3,482 (12.5)		3,984 (14.3)	
Middle	39,592 (23.2)	4,723 (11.9)		8,534 (21.6)	
Secondary	91,935 (53.9)	8,998 (9.8)		32,866 (35.8)	
Toilet facility			<0.001		<0.001
Flush toilet	1,15,325 (67.6)	12,078 (10.5)		36,579 (31.7)	
Pit toilet	25,587 (15.0)	3,162 (12.4)		5,589 (21.8)	
Dry toilet	512 (0.3)	74 (14.5)		133 (25.9)	
Open defecation or others	29,208 (17.1)	3,365 (11.5)		4,403 (15.1)	
BPL card			<0.001		<0.001
Don't possess	1,19,188 (69.9)	12,481 (10.5)		36,172 (30.4)	
Possess	51,444 (30.2)	6,198 (12.1)		10,532 (20.5)	
Marital status			0.69		<0.001
Married	1,69,405 (99.3)	18,554 (10.9)		46,294 (27.3)	
Never married/gauna not performed	663 (0.4)	67 (10.1)		250 (37.7)	
Divorced/separated	564 (0.3)	58 (10.3)		160 (28.4)	
Religion			<0.001		<0.001
Hindu	121,841 (71.4)	13,020 (10.7)		31,902 (26.2)	
Muslim	13,068 (7.7)	1,571 (12.0)		3,193 (24.4)	
Christian	18,320 (10.7)	1,799 (9.8)		7,329 (40.0)	
Sikh	11,137 (6.5)	1,523 (13.7)		2,139 (19.2)	
Others	6,266 (3.7)	766 (12.2)		2,141 (34.2)	

was attributed to higher reporting of the menstrual symptoms among urban girls.^[9]

These findings suggest that menstruation, one of the physiological conditions, is one of the factors contributing to morbidity among females. This can cause loss of productivity among females.

In the present study, the sanitary napkins were used by 27% of the study population only. The study utilizing DLHS- 3 data by E. Anand *et al.* reported use of sanitary napkins by only 14.7% women.^[10] On this basis, can we infer that the use of sanitary napkin had increased? One of the reasons could be promotion of sanitary napkin and its availability with ASHA at local level.

A community- based study conducted by Subash B. Thakre *et al.*, in the village of Soaner reported that the urban girls were more aware about the use of sanitary napkins and they practiced menstrual hygiene.^[11]

A study conducted among 400 adolescent and young married women in Chitoor district of Andhra Pradesh found that 37.5% had poor menstrual hygiene. Only 20% of them were using sanitary pads, and about 50% reused the cotton cloth several times and disposed it in open. Wide variations in the practice of menstrual hygiene can be attributed to the socio- demographic factors.

The rampant use of cloth in various studies is a source of concern. The limited supply of water for properly washing the

Table 2: Odds ratio for menstrual problems by demographic characteristics

Demographic characteristics	OR	95% CI	P
Age group (women)			
<20 years	1.08	1.001-1.17	0.047
21-25 years*			
26-30 years	1.12	1.06-1.17	<0.001
31-35 years	1.21	1.14-1.27	<0.001
36-40 years	1.26	1.19-1.32	<0.001
41-45 years	1.25	1.18-1.2	<0.001
46-50 years	1.14	1.06-1.23	0.001
Age of marriage			
Before 18 years	1.16	1.13-1.21	<0.001
After 18 years*			
Education status of women			
No education	1.24	1.17-1.32	<0.001
Primary	1.2	1.15-1.26	<0.001
Middle	1.18	1.14-1.23	<0.001
Secondary and higher*			
Toilet facility			
Flush toilet*			
Pit toilet	1.16	1.11-1.21	<0.001
Dry toilet	1.37	1.07-1.77	0.012
Open defecation or others	1.03	0.99-1.08	0.0124
BPL card			
Don't possess*			
Possess	1.14	1.11-1.18	<0.001
Marital status			
Married	0.99	0.77-1.28	0.978
Never married/gauna not performed*			
Divorced/separated	0.9	0.62-1.31	0.592
Religion			
Hindu*			
Muslim	1.11	1.05-1.17	<0.001
Christian	0.99	0.93-1.06	0.763
Sikh	1.35	1.28-1.43	<0.001
Others	1.19	1.09-1.29	<0.001
Sanitary napkin use			
Yes*			
No	1.09	1.04-1.13	<0.001

clothes used during menstruation and lack of private space for drying the clothes, further accentuates the problem. Thus, the clothes used by women for soaking blood is of poor hygiene, and usually becomes a source of infection. The association of clothes use and increased risk of RTI was also found in a study done in Mumbai.^[12,13]

The access to safe menstrual practices in addition to public health concern is also a matter of social justice and equality at work place for women.

The large proportion of women in reproductive age-group women suffers from RTI/STI and menstrual problems, and one of the predictors is menstrual hygiene, as shown in the present study. The treatments for such women are generally undertaken by the family physicians, gynecologist and primary

Table 3: Odds ratio for sanitary napkin usage by demographic characteristics

Demographic characteristics	OR	95% CI	P
Age group (women)			
<20 years	1.16	1.09-1.22	<0.001
21-25 years*			
26-30 years	0.94	0.92-0.98	0.004
31-35 years	0.87	0.84-0.91	<0.001
36-40 years	0.79	0.76-0.82	<0.001
41-45 years	0.68	0.66-0.72	<0.001
46-50 years	0.6	0.57-0.64	<0.001
Age of marriage			
Before 18 years*			
After 18 years	1.35	1.31-1.38	<0.001
Education status of women			
No education*			
Primary	1.27	1.19-1.36	<0.001
Middle	1.89	1.78-2.02	<0.001
Secondary and higher	3.52	3.31-3.74	<0.001
Toilet facility			
Flush toilet	1.97	1.89-2.04	<0.001
Pit toilet	1.24	1.19-1.30	<0.001
Dry toilet	1.56	1.26-1.92	<0.001
Open defecation or others*			
BPL card			
Don't possess	1.42	1.32-1.45	<0.001
Possess*			
Marital status			
Married	0.83	0.70-0.97	0.025
Never married/gauna not performed*			
Divorced/separated	0.97	0.76-1.26	0.065
Religion			
Hindu*			
Muslim	0.95	0.91-0.99	0.019
Christian	1.98	1.89-2.07	<0.001
Sikh	0.56	0.54-0.59	<0.001
Others	1.71	1.62-1.82	<0.001

care practitioners. The women undergoing treatment for RTI/STI are generally advised for condom use by husband and partner treatment.

In addition, while treating such women, physicians have to address the issue of usage of unhygienic clothes during menstruation and counsel the women for the use of sanitary napkins, so as to reduce the burden and prevent the recurrence of RTI. Further, it becomes the responsibility of the primary physicians to act through grass-root level workers to generate awareness for menstrual hygiene at primary care level, to have significant positive effect on the health of women in positive direction.

Conclusion

In India, current national programmes lays minimal emphasis on this domain. However, this is linked to health of women and also the health of future child, as studies have shown the association between RTI and adverse birth outcomes. The promotion of use

Table 4: Odds ratio for menstrual problems by reproductive characteristics

Reproductive characteristic	Odds ratio	95% CI	P
Outcome of pregnancy			
Spontaneous abortion	1.79	1.72-1.88	<0.001
Induced abortion	2.29	2.16-2.44	<0.001
Never used Condom/nirodh	1.09	1.03-1.14	<0.001
Ever used IUCD	1.11	1.05-1.18	<0.001
Abnormal Vaginal discharge during last three months	5.32	5.11-5.54	<0.001

of sanitary napkin during menstruation is of special concern, not only from public health point of view, but also for promoting the dignity and equality of women.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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