Research Paper

Socio-Demographic Influences on Menstrual Health and Hygiene: A Study among Gadia Lohar Women in Central Uttar Pradesh

Pankhuri[1], Prof (Dr.) Udai Pratap Singh[2]

Department of Anthropology, University of Lucknow, Lucknow, India.

Corresponding Author: Pankhuri

ABSTRACT

Menstrual health is a natural physiological process central to women's reproductive well-being. In India, it remains a significant public health and social concern, influenced by socio-demographic factors, cultural taboos, and limited healthcare access. This study explores menstrual health and hygiene practices among women of the Gadia Lohar community in Central Uttar Pradesh, focusing on socio-demographic determinants and generational shifts. Data were collected from 165 women aged 15–49 across 62 households in Lucknow and Unnao using purposive and snowball sampling. A mixed-method approach was employed, incorporating surveys, focus group discussions, and participant observation.

The mean age at menarche was 13.56 ± 1.7 years, with younger women experiencing earlier menarche, possibly due to changing nutritional and environmental factors. Menstrual disorders were reported by 81% of women, including abdominal pain (52%), back pain (48%), and menorrhagia (26%), though only 31% sought remedies, relying mostly on rest and traditional methods. A significant association was observed between menstrual problems and seeking remedies (p=0.000). Hygiene practices showed that 41% used cloth, 20% used sanitary napkins, and 34% used both. Disposal methods were poor, with 75% practicing open dumping. A strong association existed between menstrual flow and absorbent type (p=0.000). Younger women changed absorbents more frequently, yet cultural taboos like avoiding bathing during menstruation persisted. No significant association was found between hygiene practices and socio-economic or educational status, indicating that cultural beliefs and lack of awareness are stronger influences. The study underscores the need for culturally sensitive interventions, awareness campaigns, and improved access to menstrual health resources to empower women and promote well-being.

Keywords: Menstrual health, hygiene, Menarche, Socio-demographic factors, Menorrhagia, Menstrual awareness, Gadia Lohar Community

INTRODUCTION

Health disparities and gender inequality remain pressing concerns in India, deeply affecting women's overall well-being. According to the Global Gender Gap Report 2024, India ranks 129th out of 146 countries, reflecting persistent gaps in economic participation, educational attainment, health outcomes, and political representation.[1] These systemic inequalities are further highlighted by India's Gender Inequality Index (GII) score of 0.403 and a

global rank of 102, indicating significant challenges in areas such as reproductive health, labour force participation, and political empowerment.[2] These disparities are particularly acute in the domain of reproductive health, where access to menstrual hygiene products, safe sanitation, and comprehensive healthcare services remains limited, often worsened by deep-rooted social norms and stigmas.

Menstrual health is an important and necessary part of a woman's overall reproductive well-being. It is a natural biological process regulated by hormonal changes and consists of three phases: the follicular phase, ovulation, and the luteal phase. This cycle represents a critical aspect of women's health and intersects with social, cultural, and health barriers that can prevent access to appropriate menstrual hygiene and health education.[3] Menstrual experiences vary widely between individuals and can change significantly over a lifetime. While this variability is typically healthy, severe symptoms that disrupt daily life require more attention. Unfortunately, due to little awareness and education, many women endure menstrual-related challenges without receiving the necessary care. Menstrual disorders, including cramps, heavy flow (menorrhagia), light menstrual flow (hypomenorrhea), unusually infrequent (oligomenorrhea), unusually painful (dysmenorrhea), bloating, headaches, and mood changes, are common. More severe conditions, such as anemia, endometriosis, and polycystic ovary syndrome (PCOS) pose additional risks. In some cases, irregular or heavy menstrual bleeding can indicate underlying health problems, such as fibroids or cancer, emphasizing the need for early intervention and education.[3] In addition to maintaining menstrual health, it is equally important to practice proper menstrual hygiene. Not maintaining proper menstrual hygiene can cause infections and other gynecological problems, putting women's health at serious risk. The National Family Health Survey (NFHS-5) reports that 78% of women aged 15-24 use modern hygienic methods of menstrual protection. However, 50% of young women still use clothes during menstruation, which leads to unhygienic practices.[4] This gap underscores the urgent need for great awareness, access to hygiene products, and education to ensure that all women can manage their menstrual health and hygiene without the risk of preventable health complications.

This study focuses on the socio-demographic influences on menstrual health and hygiene among the Gadia Lohar community in Central Uttar Pradesh, a community that is particularly neglected by the government and lacks adequate health-related research.

THE STUDY AREA AND THE PEOPLE
The present research was conducted on the women of the Gadia Lohar community of the Lucknow and Unnao districts of Uttar Pradesh. The Gadia Lohars are a nomadic community of North India that originates in Rajasthan. Gadiya is the name given to this group's distinctive type of oxcart, and Lohar means "smith".[5] They are seen moving in several states like the Punjab, Delhi, Uttar Pradesh, Madhya Pradesh, Rajasthan, Gujarat, Maharashtra, etc. They are known by different names in different states, e.g., 'Bhubalia' or 'Bhuvalia' in Punjab; 'Bhubalia', 'Lohpitta' or 'Gadi Lohar' in Uttar Pradesh; 'Panchal Lohar', 'Chittoriya Lohar', 'Chitodi Lohar' or Gadia Lohar' in Madhya Pradesh; 'Belani', 'Dhumkuria', 'Kuwar Khati', 'Chittoriya Lohar' or 'Rajput Lohar' in Gujarat and Maharashtra.[5] The present-day Gadiya Lohars trace their roots to groups that once served Rajput princes by crafting and maintaining weapons for their armies. They were highly regarded and respected until 1567-68, when Emperor Akbar's repeated assaults on the Chittorgarh fort resulted in the decline of the Rajput dynasty. Their traditions claim that they were originally Rajput warriors and weapon makers in the fort of Chittorgarh, southern Rajasthan.

During the siege of the fort by Akbar in 1568, the Gadiya Lohars escaped through a secret doorway. They believe this act led to a curse from the goddess Kali, condemning them to a life of wandering. As a result, they became nomadic and took five vows: never to return to Chittorgarh, never to live in permanent homes, never to use light at night, and never to use a rope to draw water. They fear that their goddess might kill them if they settle. Their social status varies depending on the district they move in.[5] According to the Bhiku Ramji Idate report on the National Commission for Denotified, Nomadic, and Semi-Nomadic Tribes in 2017, Gadia Lohar was included in the additional list of Uttar Pradesh as a De-notified community.[6] The community is living below the poverty line and has a constant fear of displacement. Their beliefs and adherence to cultural customs are deeply embedded and influential in their way of life. The Anthropological Survey of India recently surveyed this community, and the publication of the survey results is awaited. [8]

MATERIALS & METHODS
The present study was conducted in two main areas of residence of the Gadia Lohar community situated in Central Uttar Pradesh: Lucknow and Unnao. The total data was from 62 households where 165 samples of women in their reproductive age (15-49 years) were collected through purposive sampling. Out of which 79 were married and 86 were unmarried. The primary collection of the data was conducted through anthropological fieldwork, and it includes both quantitative and qualitative methods. Snowball sampling is implemented to identify these two areas where these people reside in the district. Focused group discussions were also conducted to reveal fascinating insights into their heritage and cultural practices. Quasi-participant observation, voice recorders, and photography were used for data collection. The pre-tested schedule was used to collect data on Hygiene issues (like the use of sanitary napkins during menstruation), menstruation problems related questions asked (e.g. painful or not, regularity, menstruation flow during the period), any restrictions followed during menstruation and reproductive history of women (e.g. age at menarche) Some socio-economic data (e.g. education, income, marital status) were also collected. The socio-economic status of the family was assessed by using the modified B.G. Prasad classification 2024.[9] Prior to data collection, the aim of the present study was explained, and then a written consent form was signed by respondents to collect their personal information.

STATISTICAL ANALYSIS
Statistical analysis was done using IBM SPSS 25. Association was determined using a chi-square test or Fisher's exact test, as appropriate. P value <0.05 was considered significant for all tests.

RESULT
Socio-demographic profile of respondents
Table 1 shows the distribution of Demographic characteristics, including the respondents' Education level and Economic status. It shows that the majority of participants (70.3%) had no formal education, with the highest representation of 23% in the 35-49 age group, followed by 21.2% had dropped out of formal education, with the majority of 12.7% in the 15-19 age group, secondary education was 8.5% all in 15-19 age group. Economic status represents that the maximum number of participants (72.1%) belong to class IV predominantly in the 15-19 age group (26.7%), followed by 24.8% belonging to class V, and only 3% were classified as class III according to the modified BG Prasad classification.[9]

**Table 1: Distribution of Demographic characteristics of respondents-**

Variables-		Age groups					Total
		15-19	20-24	25-29	30-34	35-49	
Education level	No education	27 (16.4%)	20 (12.1%)	16 (9.7%)	15 (9.1%)	38 (23%)	116 (70.3%)
	Secondary education	14 (8.5%)	0	0	0	0	14 (8.5%)
	Drop out	21 (12.7%)	9 (5.5%)	2 (1.2%)	3 (1.8%)	0	35 (21.2%)
Total		62 (37.6%)	29 (17.6%)	18 (10.9%)	18 (10.9%)	38 (23%)	165 (100%)
Economic status (BG Prasad Modified)	Class III (2739-4565)	1 (0.6%)	0	1 (0.6%)	0	3 (1.8%)	5 (3%)
	Class IV (1370-2738)	44 (26.7%)	22 (13.3%)	12 (7.3%)	15 (9.1%)	26 (15.8%)	119 (72.1%)
	Class V (less than 1370)	17 (10.3%)	7 (4.2%)	5 (3%)	3 (1.8%)	9 (5.5%)	41 (24.8%)
Total		62 (37.6%)	29 (17.6%)	18 (10.9%)	18 (10.9%)	38 (23%)	165 (100%)

Menstrual health and hygiene practices

Menstrual health and hygiene are important issues that, when neglected, can adversely affect women's reproductive health. The study focuses on menstrual health and evaluates the age at menarche, menstrual cycle length, duration, and flow of menstruation, challenges experienced during menstruation, and preferred remedies for relief. In terms of menstrual hygiene practices, the study evaluates the type of menstrual products used, the frequency of product changes, disposal methods,

Pie chart 1: Frequency of age at menarche of respondents
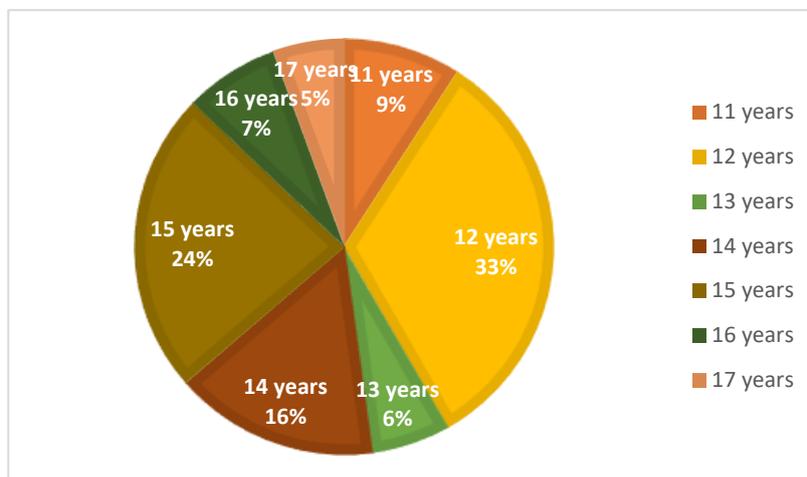
Pie chart 1 depicts that out of 165 respondents, the maximum number of respondents had their menarche at 12 years (33%, 54 respondents), followed by 15 years (24%, 39 respondents) and 14 years (16%, 26 respondents). The mean age of menarche was 13.56 ±1.7 years.

Bar Graph 1: Distribution of Age at Menarche Across Different Age Groups of Respondents
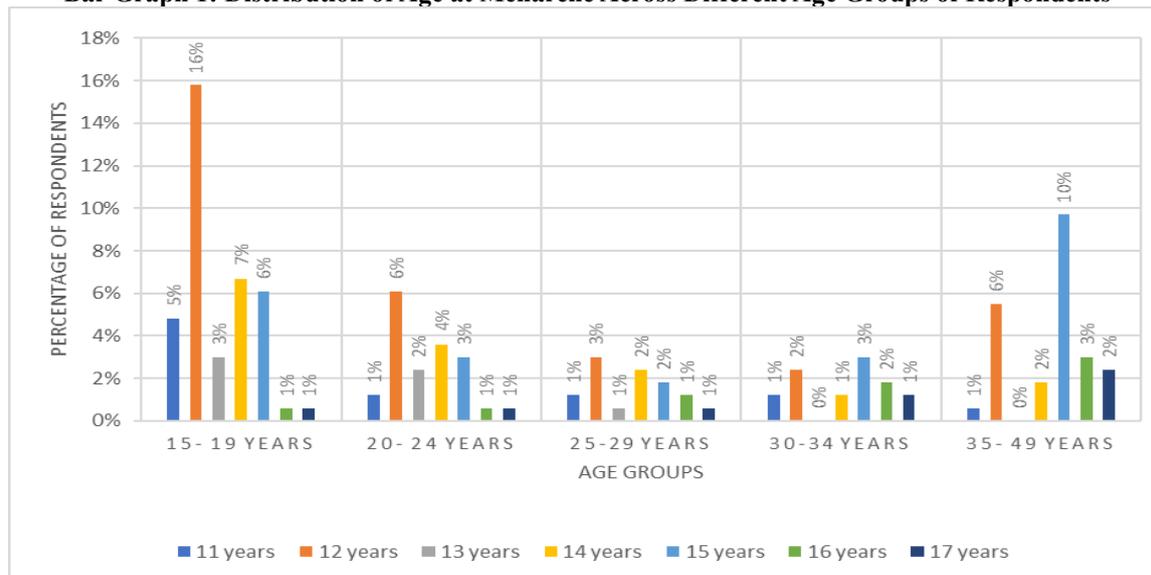
Bar graph 1 shows the percentage of respondents across various age groups based on their age at menarche. The majority of respondents in the age group 15-19 years experienced menarche at 12 years (16%, or 26 respondents), followed by notable ages of menarche in this group including 14 years (7%, or 11 respondents), and 15 years (6%, or 10 respondents). In the age group 20-24 years the maximum reported menarche age is 12 years (6%, or 10 respondents), small percentages were observed for 14 years (4%, or 6 respondents), and 13 years (3%, or 4 respondents). The 25-29 years age respondents are relatively lower overall and their ages at menarche include 12 years (3%, 5 respondents), 14 years (2%, or 4 respondents), and 13 years (1%, or 1 respondent). The age group of 30-34 respondents is also relatively lower overall. Their age at menarche includes 15 years (3%, or 5 respondents), 12 years (2%, or 4 respondents), and 16 years (2%, or 3 respondents). The maximum percentage of age at menarche in the age group 35-49 years was 15 years (10%, or 16 respondents), followed by 12 years (6%, or 9 respondents), and 16 years (3%, or 5 respondents).

Table 2: Menstrual characteristics of respondents-

Menstrual characteristics		Age groups					Total
		15-19	20-24	25-29	30-34	35-49	
Menstrual cycle length	Normal (21-35 days)	48 (29.1%)	24 (14.5%)	13 (7.9%)	12 (7.3%)	21 (12.7%)	118 (71.5%)
	Polymenorrhea (less than 21 days)	10 (6.1%)	3 (1.8%)	4 (2.4%)	2 (1.2%)	11 (6.7%)	30 (18.2%)
	Oligomenorrhea (more than 35 days)	4 (2.4%)	2 (1.2%)	1 (0.6%)	4 (2.4%)	6 (3.6%)	17 (10.3%)
Total p-value= 0.139		62 (37.6%)	29 (17.6%)	18 (10.9%)	18 (10.9%)	38 (23%)	165 (100%)
Duration of Menstrual Flow	Normal (2-6 days)	41 (24.8%)	23 (13.9%)	17 (10.3%)	10 (6.1%)	30 (18.2%)	121 (73.3%)
	Hypomenorrhea (less than 2 days)	5 (3%)	4 (2.4%)	0 (0%)	6 (3.6%)	7 (4.2%)	22 (13.3%)
	Menorrhagia (more than 7 days)	16 (9.7%)	2 (1.2%)	1 (0.6%)	2 (1.2%)	1 (0.6%)	22 (13.3%)
Total - p-value= 0.000		62 (37.6%)	29 (17.6%)	18 (10.9%)	18 (10.9%)	38 (23%)	165 (100%)

Amount of bleeding flow	Scanty (Hypomenorrhea)	8 (4.8%)	7 (4.2%)	4 (2.4%)	12 (7.3%)	13 (7.9%)	44 (26.7%)
	Moderate (Normal)	34 (20.6%)	16 (9.7%)	10 (6.1%)	3 (1.8%)	16 (9.7%)	79 (47.9%)
	Heavy (Menorrhagia)	20 (12.1%)	6 (3.6%)	4 (2.4%)	3 (1.8%)	9 (5.5%)	42 (25.5%)
Total p-value= 0.000		62 (37.6%)	29 (17.6%)	18 (10.9%)	18 (10.9%)	38 (23%)	165 (100%)

Table 2 shows the age-wise variation of the respondents' menstrual characteristics. Out of 165 respondents, the maximum number of respondents (71.5%) had their normal menstrual cycle lengths (21-35 days), 18.2% of respondents had Polymenorrhea (menstrual cycle length less than 21 days), and only 10.3% had Oligomenorrhea i.e., their menstrual cycle length is more than 35 days. There is no statistical association between age and cycle length (p-value 0.139). The duration of blood flow was found to be between 2-6 days, i.e., normal in a majority (73.3%) of the respondents. The 15-19 age group had the highest prevalence (24.8%), followed by 13.3% of respondents who had less than 2 days, with the highest prevalence in the 35-49 age group (4.2%). 13.3% of respondents were found to have menorrhagia and had a duration of blood flow of more than 7 days, with the highest occurrence in the 15-19 age group (9.7%). The amount of blood flow was scanty in 26.7% of respondents, with the highest prevalence in the 35-49 age group (7.9%) and 30-34 age group (7.3%), whereas the majority 47.9% had moderate blood flow, followed by 25.5% of respondents who had heavy menstrual flow (menorrhagia), with the highest prevalence in the 15-19 age group (12.1%). The significant associations were found for the duration of menstrual flow (p=0.000) and the amount of bleeding (p=0.000).

Menstrual problems

Bar graph 2: Problems experienced by respondents of different age groups during menstruation

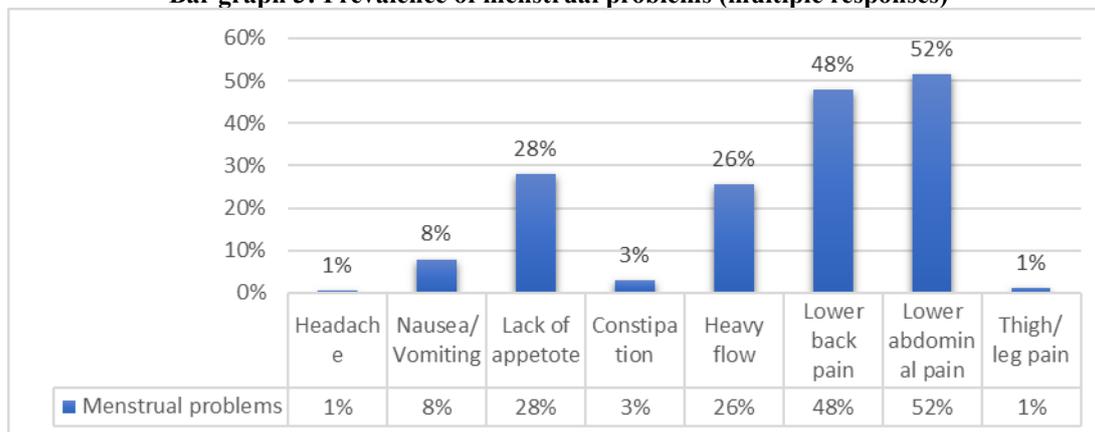| Age groups	15-19	20-24	25-29	30-34	35-49
No problems	9%	2%	2%	1%	5%
One problem	10%	8%	3%	4%	5%
2 problems	12%	5%	3%	4%	4%
3 problems	7%	2%	1%	1%	9%
more than 3 problems	1%	0%	2%	0%	1%
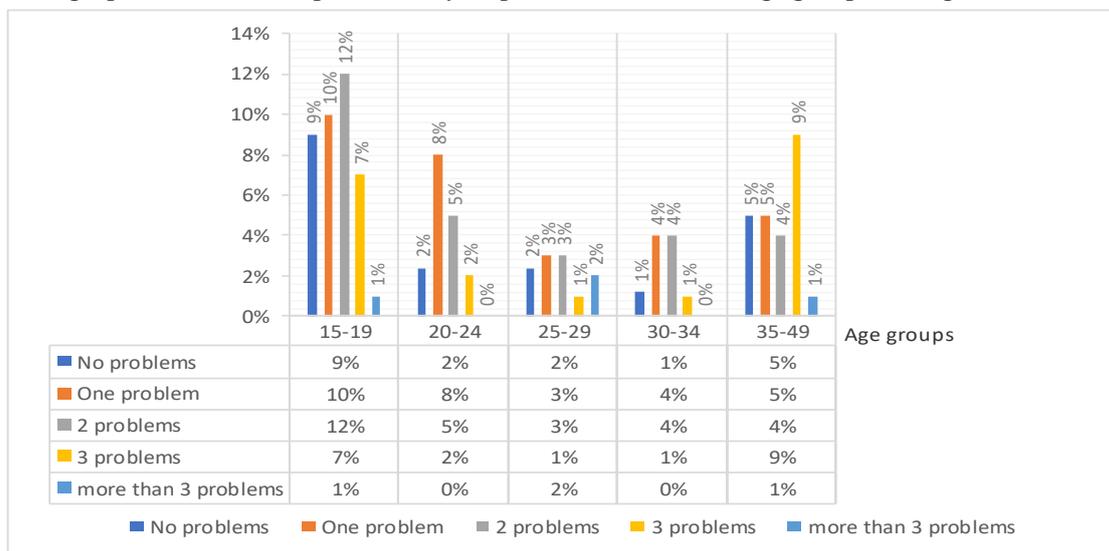
The above bar graph 2 depicts the prevalence and distribution of menstrual problems among the respondents of different age groups. 19% (31) of the respondents reported no menstrual problems and overall, a maximum of 81% (134) of the respondents reported experiencing at least one menstrual problem. In the present study, respondents in the age group 15-19 years had the highest prevalence of menstrual problems, with 12% (19) having two problems, 10% (16) having one problem,

and 7% (12) experiencing three problems. In the age group 20-24 years, most respondents (8%, 13 respondents) experienced one problem. A relatively even distribution was observed in the 25-29 years age group, with 3% (5) each reporting one problem or two problems, while 4% (7) experienced one or two problems in the 30-34 years age group. Among the 35-49 years age group, 9% (14) experienced three problems, followed by 5% (8) and 4% (7) reporting one and two problems, respectively.

Bar graph 3: Prevalence of menstrual problems (multiple responses)

	Headache	Nausea/ Vomiting	Lack of appetote	Constipation	Heavy flow	Lower back pain	Lower abdominal pain	Thigh/ leg pain
■ Menstrual problems	1%	8%	28%	3%	26%	48%	52%	1%

The above bar graph 3 shows the frequently occurring common problems among the respondents, revealing that multiple issues were often reported simultaneously. The most common were lower abdominal pain (52%) and lower back pain (48%). Loss of appetite (28%) and heavy flow (26%) were also prevalent. Less common problems included nausea/vomiting (8%), constipation (3%), thigh/leg pain (1%), and headache (1%). The findings reveal the prevalence of multiple menstrual problems among respondents, with a high prevalence of lower abdominal pain, followed by lower back pain.

Bar graph 4: Percentage of Respondents Using and Not Using Remedies Across Different Ranges of Menstrual Problems.
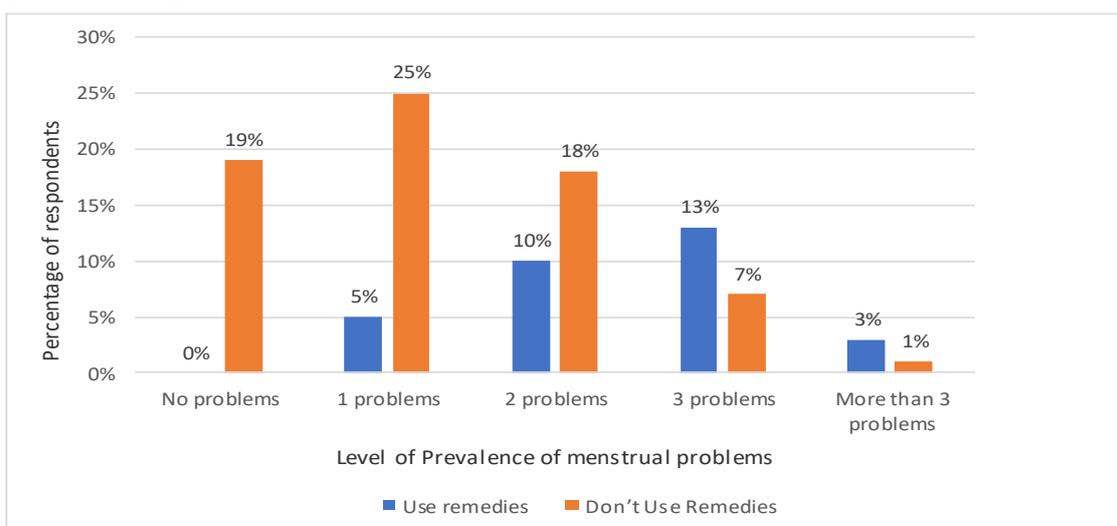
The present study depicts that out of 165 respondents, 19% (31 respondents) reported no menstrual problems, while the majority, 81% (134 respondents) experienced

menstrual issues. Bar chart 4 illustrates the relationship between the severity of menstrual problems and the use of remedies. Among those with menstrual issues, 30% (49 respondents) reported having only one problem, of whom 25% (40 respondents) did not use remedies. 28% (46 respondents) of respondents had two menstrual problems, and out of them, 18% (30 respondents) didn't use remedies. The respondents with three and more than three problems relied more on remedies. For three problems, 13% (21) of respondents used remedies, compared to about 7% (12) who did not. For more than three problems, most participants 5, 3%) relied on remedies, while a minimal number 1, (1%) refrained from using them. Overall, 50% (83 respondents) with menstrual problems did not use remedies, while 31% (51 respondents) relied on remedies such as allopathy medicines for severe problems and homemade remedies such as ginger tea, Dariya- made with Carrom seeds or ajwain, jaggery, oil, wheat, and Kada, or they simply taking rest to manage their menstrual problems. There is a strong statistical association between the severity of menstrual problems and the use of remedies for managing these problems (p= 0.000).

Menstrual hygiene practices-
The distribution of menstrual hygiene products among the respondents shows that the majority of females were using cotton cloth (41%, 67 respondents), followed by sanitary napkins (20%, 33 respondents), Both cloth and sanitary napkins (34%, 56 respondents), and only 5% (9 respondents) were using nothing during the menstruation.

Bar graph 5: Distribution of menstrual flow intensity and menstrual product usage
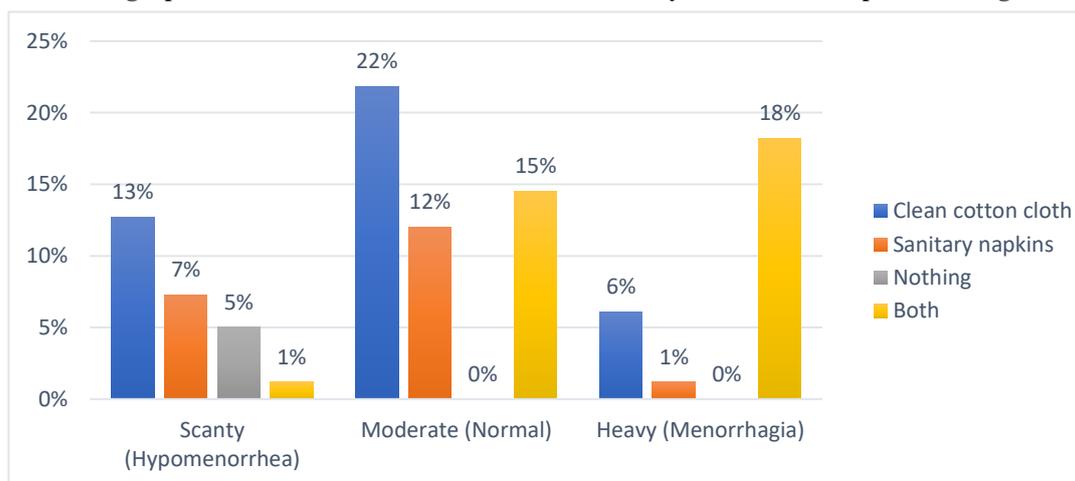
Bar graph 5 shows that the most commonly used product among the respondents was clean cotton cloth, particularly those with normal (22%, 36 respondents) and scanty (13%, 21 respondents) menstrual flow. In contrast, sanitary napkins are less frequently used, with their higher usage (12%,19 respondents) observed in the normal flow category. The mixed practices usage of both cloth and sanitary pads is more prevalent (18%, 30 respondents) among women experiencing heavy menstrual flow (menorrhagia), and a small percentage (6%, 9 respondents) of women with scanty flow reported using no menstrual products. There is a strong, significant association between the amount of menstrual flow and the usage of menstrual products (p-value= 0.000)

Frequency of changing Absorbents

Table 3: Age-Wise Distribution of Menstrual Product Usage and Frequency of Product Change Among Respondents

Menstrual practices		Age groups					
Menstrual hygiene products	Change menstrual product per day	15-19	20-24	25-29	30-34	35-49	Total
Clean cotton cloth	1 time	4	1	0	2	2	9 (5.5%)
	2 times	3	4	2	4	5	18 (10.9%)
	3 times	12	8	2	0	5	27 (16.4%)
	4 times	5	1	2	0	3	11 (6.7%)
	5 times	0	0	0	0	2	2 (1.2%)
	6 times	0	0	0	0	0	0
	Total	24 (14.5%)	14 (8.5%)	6 (3.6%)	6 (3.6%)	17 (10.3%)	67 (40.6%)
Sanitary napkins	1 time	2	2	2	2	2	10 (6.1%)
	2 times	1	2	0	1	1	5 (3%)
	3 times	5	2	3	1	5	16 (9.7%)
	4 times	1	0	0	0	0	1 (0.6%)
	5 times	0	0	0	1	0	1 (0.6%)
	6 times	0	0	0	0	0	0
	Total	9 (5.5%)	6 (3.6%)	5 (3%)	5 (3%)	8 (4.8%)	33 (20%)
Both	1 time	0	1	0	0	0	1 (0.6%)
	2 times	2	1	1	0	2	6 (3.6%)
	3 times	11	4	2	1	6	24 (14.5%)
	4 times	9	3	2	1	2	17 (10.3%)
	5 times	0	0	0	1	0	1 (0.6%)
	6 times	5	0	1	1	0	7 (4.2%)
	Total	27 (16.4%)	9 (5.5%)	6 (3.6%)	4 (2.4%)	10 (6.1%)	56 (33.9%)
Nothing	0 times	2 (1.2%)	0	1 (0.6%)	3 (1.8%)	3 (1.8%)	9 (5.5%)
Total p-value= .000		62 (37.6%)	29 (17.6%)	18 (10.9%)	18 (10.9%)	38 (23%)	165 (100%)

The study revealed that among the females of the Gadia Lohar community, the majority (41% or 67 respondents) reported changing their absorbents three times per day. Equal proportions of respondents (18%, 29 each) change their absorbents either two or four times per day, 12% (20) respondents only 1 time per day, and a very small percentage of respondents change their absorbents 5 (2%, 3 respondents) or 6 times (4%, 7 respondents) per day. These findings show that most females in this community were majorly changing their menstrual absorbents three times per day.

Table 3 depicts the menstrual hygiene practices of respondents across different age groups (15-49 years), focussing on the type of products used and the frequency of changing them. Out of 165 respondents, the most common practice was using clean cotton cloth (40.6%, 67 respondents). The frequency of changing clean cotton cloth varied, with 27 respondents (16.4%) changing 3 times a day being the most common. The majority of clean cotton cloth users were the respondents in the age group of 15-19 years. A total of 33 (20%) respondents used sanitary napkins and most of the sanitary napkin users16 respondents (9.7%) changed their product 3 times a day. The respondents aged 15-19 years maximum used sanitary napkins (5 respondents or 3%). A total of 56 respondents (33.9%) used both clean cotton cloth and sanitary napkins, for this the highest frequency of changing products, with 24 respondents (14.5%) changing 3 times a day, followed by 17 women (10.3%) changing 4 times a day. The maximum users were in the 15-19 years age- group (27 respondents or 16.4%). There is a strong significant association between menstrual hygiene products and the frequency of

changing menstrual products per day across the different age groups (p-0.000).

Disposal of Menstrual Products

The study observed that none of the women were found to reuse their menstrual products during menstruation. For disposal, the majority (75%) of respondents resorted to open dumping into field areas or open plots. Another 11% of respondents combined open dumping with the use of community toilet dustbins, 7% disposed of products along with general garbage, and 7% used dustbins exclusively.

Bathing Practices

Regarding bathing practices during menstruation, 72.1% (119 respondents) did not take regular baths, while the rest 27.9% (46 respondents) did. The maximum number of respondents who bathed during menstruation was in the 15-19 years of age group (16 respondents or 9.7%), followed by the 35-49 years (11 respondents or 6.7%), and 20-24 years (10 respondents or 6.1%) age groups.

Table 4: Association of Income and Education with Menstrual Hygiene Practices among Respondents

Menstrual Hygiene practices	Variable-1			Variable-2	
Use of menstrual hygiene products	Household economic status (BG Prasad classification)	Total		Education level	Total
Clean cotton cloth	Class V	20		No education	51
	Class IV	45		Secondary Education	6
	Class III	2		Drop out	10
	Total	67 (40.6%)		Total	67 (40.6%)
Sanitary napkins	Class V	4		No education	25
	Class IV	28		Secondary Education	0
	Class III	1		Drop out	8
	Total	33 (20%)		Total	33 (20.0%)
Nothing	Class V	1		No education	7
	Class IV	7		Secondary Education	1
	Class III	1		Drop out	1
	Total	9 (5.5%)		Total	9 (5.5%)
Both	Class V	16		No education	33
	Class IV	39		Secondary Education	7
	Class III	1		Drop out	16
	Total	56 (33.9%)		Total	56 (33.9%)
	p-value	0.236		p-value	0.115
Total		165 (100%)		Total	165 (100%)

The above table 4 represents the association of usage of menstrual hygiene products with two variables- household economic status (based on B G Prasad classification) and the education level of the respondents. Clean cotton cloth was predominantly used by Class IV (45 individuals) and females with no education (51 individuals). Sanitary napkins were mostly used by Class IV (28 individuals) and mostly by females with no education (25 individuals). Among those who used no menstrual hygiene products, 7 respondents belonged to Class IV, followed by 1 each in Class III and V, and the majority of respondents with no education (7 individuals). A total of 56 respondents used both clean cotton cloth and sanitary napkins. Among these, 39 individuals belonged to Class IV, followed by 16 in Class V, and 1 in Class III. In terms of

education, 33 with no education and 16 females who had dropped out also used both products. Fisher's exact test results indicate that there is no significant association between Household economic status and the use of menstrual hygiene products, nor is there a significant association between education and the choice of menstrual hygiene products.

DISCUSSION

The present study shows that the mean age of menarche of the Gadia Lohar community respondents was 13.56 ±1.7 years with a majority of participants (33%) having menarcheal age of 12 years, which is similar to the studies carried out in chawls (buildings) located in the Naigaon area of Parel in Mumbai, Karad in Maharashtra, and Meerut in Uttar Pradesh, which showed that the mean age at menarche of their respondents was 13.4, 13.13 years and 13.16 years, respectively.[9] [11] [12] The distribution of Age at menarche across different age groups of respondents (Bar graph 1) demonstrates a generational shift towards an earlier age at menarche in younger age groups (15- 19 and 20-24 years), with 12 years being the most frequently reported age. In contrast, the older age groups (30-34 years and 35-49 years) experienced menarche at a relatively later age, particularly 15 years, which reflects a later onset of puberty in earlier generations and earlier puberty in younger generations which may be caused by poor nutrition, environmental stress, exposure to pollutants. The menstrual characteristics involve menstrual cycle length, flow, and the amount of bleeding flow (Table 4). There is no statistical association between age groups and cycle length, with a p-value of 0.139. Similarly, a study conducted by V G Rahatgaonkar in Pune city found no significant association, with a p-value of 0.138, between age and the number of bleeding days.[13] In the present study, only 10.3% of respondents had oligomenorrhea (cycle length of more than 35 days), 25.5% had heavy menstrual flow, and 26.7% had

scanty flow. A Similar finding is reported by Mohite R V et.al in Western Maharashtra, out of 230 adolescents, 16.08% had oligomenorrhea (more than 35 days menstrual cycle length), 17.82% had menorrhagia (heavy bleeding), and 59.56% had hypomenorrhea (scanty bleeding). In another study by Omidvar et.al in an urban area of South India, 43.1% of respondents had hypomenorrhea and 31.4% had menorrhagia.[14][15] The present study findings also reveal notable age-related differences in menstrual characteristics among the respondents. Adolescents (15-19 years) were more prone to menorrhagia or heavy flow, while older women (35-49 years) were more likely to experience hypomenorrhea or scanty flow, maybe the reason for hypomenorrhea is hormonal changes as they approach the perimenopause stage or they experience stress which may be affecting their menstrual flow. In the present study, a maximum of 81% of respondents have been reported to suffer from experiencing at least one menstrual problem. Lower abdominal pain (52%), Lower back pain (48%), lack of appetite (28%), and Heavy flow (17%) were the most reported problems. In Mumbai, a similar study conducted by H. Thakur et.al revealed that the most common problem faced during menstruation was abdomen pain 70.6% among young women and 81% among adults followed by backache (27.9% of young women, 23.8% adult women), and body ache (23.5% young women,9.5% adult women). Other studies conducted among women of West Bengal and Haryana found that a maximum of 60% and 77.6% of respondents, respectively, have faced lower abdominal pain at the time of the menstruation period.[9][16] The present study reveals that among respondents experiencing menstrual problems (81%), 31% relied on remedies. Specifically, 30% of respondents had one menstrual problem, of whom 25% of respondents did not use any remedies. In contrast, among those with more than three menstrual problems (4%), the majority of respondents, i.e., 3%, relied

on remedies. A statistically significant association was observed between the range of menstrual problems and the use of remedies, with a p-value of 0.000, indicating that as the number of menstrual problems increases, the likelihood of using remedies also increases. They usually relied on allopathy medicines for severe problems; otherwise, for minor problems, they relied on homemade remedies such as ginger tea, Dariya- made with Carrom seeds or ajwain, jaggery, oil, wheat, and Kada, or they simply rested to manage their menstrual problems. This is consistent with the findings of earlier research among Juang women of Odisha, which reported that one-third (32.7%) sought treatment for menstrual problems.[17] Similarly, a study conducted in Western Maharashtra found that out of 237 respondents, 25.73% sought treatment, whereas a maximum of 74.26% did not attempt to seek treatment for their menstrual problems. [14]

Unhygienic and inappropriate menstrual practices can result in severe health issues, including reproductive tract infections, urinary tract infections, and various sexually transmitted diseases. Additionally, they may increase the risk of life-threatening conditions like cervical cancer.[11] The present study depicts the proportion of menstrual practices of clean cloth and disposable absorbent sanitary napkins, and both among the respondents were 41%, 20%, and 34%, respectively. Similarly, a study conducted by Dasgupta A. and Sarkar M (2008) reported that a majority of women used pieces of cloth during menstruation (42.5% used old cloth, 6.25% used new cloth), followed by mixed practice of using both cloth pieces and sanitary pads (40%) and only 11.25% were used sanitary pads during menstruation.[18] A strong, significant association was found between the amount of menstrual flow and the usage of menstrual products, with a p-value of 0.000, showing that women with moderate flow predominantly used clean cotton cloth (22%). Conversely, sanitary napkins were less frequently used (12%), with the highest

usage observed among those with normal flow, mixed usage of both sanitary pads and cloth was common among respondents experiencing heavy menstrual flow (18%), suggesting that women with higher menstrual flow may rely on multiple products for better management. The majority of respondents (41%) reported changing their absorbents three times per day. A similar finding was reported by C Barthakur and M Barkataki in their study conducted in Guwahati, Assam. They found that 31.3% of respondents changed their absorbent three times a day, while the majority (43.7%) changed them twice a day- a frequency higher than that observed in the present study for two times changes.[19] Table 5 shows a significant association between the type of menstrual hygiene products used and the frequency of changing these products per day across the different age groups (p-value= 0.000), The 15-19 years age group reported higher usage of clean cotton cloth (14.5%) and more frequent changes (3 times per day) compared to older age groups (10.3%). In contrast, a higher proportion of respondents in the 35- 49 years age group reported not using any products (1.8%) or using fewer sanitary napkins (4.8%) compared to younger women (5.5%). The lack of product use among older women may be attributed to the perimenopausal stage- the time before menopause, which signals the end of the reproductive years.[20] At the same time, the use of cotton cloth could be linked to limited access to or awareness of sanitary napkins, often influenced by socioeconomic or educational constraints.

The respondents of this community had no information about the proper disposal method of menstrual absorbents. In this study, the majority of respondents (75%) reported disposing of their menstrual products through open dumping. In contrast to the study, Bhattacherjee et al. found that 49% of females disposed of the used sanitary napkins correctly.[21] Our observation of their practices of personal hygiene during menstruation revealed that a

maximum of 72.1% of respondents did not take regular baths during this period. Some explained that they believed their body becomes warm during menstruation, and bathing could cool it, causing uterine contractions. They feared this might disturb their menstrual cycle, reduce the flow, or even affect fertility. Others followed this practice based on instruction from their elders. Similarly, a study conducted among the Gujjar tribe in Jammu and Kashmir by Dhingra et.al reported that not all of the women did not brushed their teeth or bathed during menstruation, as instructed by their elders.[22] In many parts of India, perceptions rooted in Hinduism associate bodily excretions, including menstruation, believed to being polluting and impure. Water, considered a sacred medium of purification and physical manifestation of Hindu deities, is often protected from perceived pollution. This belief may explain the restriction on bathing during menstruation, particularly in the initial days.[23]

The present study shows that there is no significant association between the types of absorbents and socio-economic status, i.e., Household economic status and Education level, with a p-value of 0.236 and 0.115, respectively. In contrast to this, a study in Assam conducted by N Das and A.S Tasa shows that the educational status of their respondents has a significant association with the type of absorbent during menstruation.[24] One possible reason for the lack of significant association could be the relatively small size, which may have limited the statistical power of the tests. It is also possible that other variables, such as awareness, knowledge about menstrual hygiene, or cultural practices, could have a significant association with the education or income levels of the respondents.

CONCLUSION

The present study concludes that menstrual health and hygiene practices are significantly influenced by age, education, and socio-cultural norms. A generational shift in the age at menarche is present in the study, with younger women reporting earlier onset compared to older women, likely influenced by factors such as nutrition and environmental stress. Adolescents commonly experience menorrhagia, while older women face hypomenorrhea, and common menstrual issues like abdominal and back pain are frequently ignored due to limited access to healthcare and a lack of focus on menstrual health. Menstrual hygiene practices revealed a reliance on clean cotton cloth, limited use of sanitary napkins, and inadequate disposal methods, with most respondents disposing of absorbents through open dumping. Cultural beliefs, like avoiding bathing during menstruation, reveal significant gaps in both awareness and infrastructure for safe menstrual hygiene management.

SUGGESTIONS

The Gadia Lohar Community in Uttar Pradesh faces significant challenges due to a lack of official census data and health-related studies, which has led to neglect by the government and left the community without adequate support. Conducting research and collecting health data can fill these gaps, providing the necessary information for targeted interventions and improving health services that enhance the overall well-being of the community. Women in the Gadia Lohar community face poor menstrual health and hygiene. Addressing the issues, educational campaigns focused on the importance of menstrual health should be implemented. Promoting modern menstrual hygiene products, such as affordable sanitary napkins, and improving access to healthcare services will help reduce menstrual-related problems. Additionally, collaboration with government bodies and NGOs can support the introduction of policies and programs for the specific needs of the Gadia Lohar community.

Declaration by Authors
Ethical Approval: Approved

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