Assessment of menstrual knowledge, beliefs and hygiene practices among ethnic groups in isolated populations in Pakistan

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Abstract

Background: Knowledge about menstruation and menstrual hygiene significantly impacts women's health and it is often influenced by economic, cultural and religious factors.

Aim: To assess knowledge about menstruation and menstrual hygiene among the Kho and Kalash ethnic groups in Chitral, Pakistan.

Methods: From May to September 2023, this cross-sectional study collected data on knowledge about menstruation and menstrual hygiene practices from 415 Kho and 105 Kalash women in Pakistan. The data were analysed using SPSS version 22 and associations between the variable factors were analysed using chi-square test ($P < 0.05$).

Results: Respondents aged 14–20 years had better knowledge about menstruation than older adults and educated women were nearly 4 times more knowledgeable than illiterate women (49% vs 13%). Respondents with educated mothers had better knowledge about menstruation than those with illiterate mothers (52% vs 43%, $P = 0.003$). There was a significant difference in menstrual hygiene practices between Kalash and Kho women ($P < 0.0001$); Kalash women reported better practices than the Kho (90% vs 46%). The main sources of information about menstruation before menarche were friends (44%), mass media (21%) and elder sisters (13%).

Conclusion: Knowledge about menstruation and menstrual hygiene is poor among the study population, indicating the need for targeted interventions and policies to improve knowledge and hygiene practices, thereby improving menstrual health among the women.

Keywords: menstruation, menstrual hygiene, menarche, cultural practice, Bashalini, Kalash, Kho, Chitral, Pakistan

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Introduction

Menstruation is a natural biological process that significantly impacts women's physical, mental and social wellbeing. On average, a woman spends 6–7 years of her life menstruating (*1*). Adequate knowledge of menstruation and hygienic practices is essential for improving health outcomes and empowering women. The Global Menstrual Collective defines menstrual health as a state of physical, mental and social wellbeing in relation to the menstrual cycle. It emphasises the need for access to accurate information, appropriate hygiene materials, safe sanitation facilities, healthcare and a supportive, stigma-free environment (*2*). UNICEF notes that addressing menstrual health and hygiene is crucial for achieving global Sustainable Development Goals (SDGs) related to education, health, gender equality and water, sanitation and hygiene (*3*). Information and awareness about menstruation are essential for effective menstrual health management. Education should extend beyond menstruating women to include men, health care providers and the wider community to help eliminate stigma (*4*). This is particularly important in low-resource settings, where cultural and economic barriers often limit access to menstrual health resources.

The use of appropriate menstrual hygiene materials is often influenced by poverty, cost and access. In some low-income countries, over 80% of menstruating females use cloth or toilet paper, while only 18% have access to sanitary pads (*2*). The reuse of old cloth is common in parts of Africa and South Asia, increasing the risk of reproductive tract infections (*1,5*). Menstrual disorders and other difficulties associated with menstruation, including pain and physical and emotional discomforts, affect the quality-of-life (*6*). Adequate infrastructure and services for changing, drying and disposal are necessary to ensure both physical and emotional wellbeing while also minimising environmental impact (*7*).

Cultural beliefs shape menstrual perceptions and practices worldwide. In Greek mythology, menstrual blood was believed to hold divine power (*8*). In Hinduism, the *Vedas* associate menstruation with impurity, tracing its origins to the sin of *Brahmatya* (killing a Brahman) committed by the god Indra, which was then believed to have been transferred to women (*9*). The !Kung tribe

of the Kalahari Desert openly celebrates menstruation, confining menarcheal girls to huts, where they are publicly observed as part of the ritual (*10*). Among the Kalash, an indigenous community living in the mountain valleys of Chitral, Khyber Pakhtunkhwa, Pakistan, menstruation is governed by a cultural belief system that distinguishes between *ongesta* (purity) and *pragata* (impurity). Menstruating women are considered *pragata* and isolate themselves in a purpose-built communal space called the *bashalini*, which is off-limits to men and non-menstruating women (*11–13*). During menstruation and childbirth, Kalash women avoid physical contact, sharing utensils and participating in school and religious activities. However, they are permitted to pray inside the *bashalini*, seeking blessings from Dezalik, the Kalash deity of fertility, for conception and safe childbirth. Women in labour remain in the *bashalini* from childbirth until they recover (*11–13*).

Although efforts are being made globally to address menstrual health, local cultural practices, such as those observed among the Kalash and Kho communities, play a significant role in shaping menstrual health outcomes. Understanding menstrual knowledge and practices within specific populations plays a crucial role in shaping health policies that promote gender equality and human rights – key components of the SDGs.

This study assessed menstrual knowledge, beliefs and hygiene practices among the Kho and Kalash ethnic groups in Chitral, Pakistan. There is a gap in literature regarding the Chitrali population, an isolated community inhabiting the Hindukush ranges of northwestern Pakistan. The findings provide valuable insights for promoting safe and hygienic menstrual practices, enhancing the quality-of-life of those who menstruate and contribute to a more equitable society.

Methods

Study area

This descriptive cross-sectional study was conducted in Chitral, Khyber Pakhtunkhwa Province, Pakistan, between May and September 2023. The Chitral Valley covers an area of 14 850 km^2, with geographical coordinates of 35°51.108' N latitude and 71°47.182' E longitude. It is bordered by Upper Dir District to the south, Swat District to the southeast, Gilgit-Baltistan Province to the east and Afghanistan to the west.

The region has a population of over 440 000, comprising 2 major ethno-religious groups: the Kho Muslims, who form the majority, and the Kalash minority (*14*). The Kho, who populate most of the area, speak Khowar, while the Kalash, an ethno-culturally distinct group, speak Kalasha. The Kalash number approximately 4000 and inhabit the 3 southern valleys of Chitral – Bumburet, Birir and Rumbur. Unlike the Muslim groups surrounding them in northwestern Pakistan, the Kalash have preserved their unique cultural traditions (*12,13*).

Data collection and analysis

Data were collected using a semi-structured, self-administered questionnaire, the contents of which were adapted after reviewing relevant literature (*2,5,15*). The questionnaire was then modified according to the objectives of this study.

We used a combination of stratified and random sampling techniques to collect data from all Tehsils in Chitral, including Mulkhow, Torkhow, Mastuj, Drosh, Chitral and Lotkoh, as well as the Kalash valleys of Bumburet and Rumbur. We selected a proportionate number of educational institutions – girls' schools, colleges and University of Chitral – public places and community centres for the study. Participants from the Kalash valleys were identified through *bashalinis*.

Data collection was conducted by 3 undergraduate students (2 Kho and 1 Kalash), who are co-authors of this study. They were trained in bioethics and received refresher training on research ethics and data confidentiality. The heads or principals of the educational institutions were informed about the study's objectives and data collection was conducted at predetermined periods convenient for the management staff, following consent approval. Data were collected using a structured questionnaire through face-to-face interviews. Clarifications regarding specific terms were provided to participants to ensure accurate and complete responses. Similarly, community centres were approached with prior communication through regular members. The sample size was calculated using OpenEpi (www.openepi.com).

The questions were categorised into 4 sections: demographic variables (age, marital status, religion, family type, family size and occupation); knowledge about menstruation; menstrual practices and hygiene; and characteristics of participants' menstruation. The knowledge section included 6 specific questions, while the practices and hygiene section included 9 questions. Each 'yes' response was awarded one mark, while 'no' or 'do not know' responses received zero mark. The total knowledge score was 6 and the practices and hygiene score was 9. The mean scores for knowledge (3.36 ± 1.22) and practices (5.58 ± 1.46) were used as cutoff points (*15,16*). Respondents with a score of ≥4 were categorised as having good knowledge, while those scoring ≤3 were categorised as having poor knowledge. Similarly, respondents with a score of ≥5 were considered to have good practices and hygiene, while those scoring ≤4 were classified as having poor practices and hygiene.

The data were entered into MS Excel and exported to SPSS (version 22.0) for analysis. An exploratory data analysis scheme was used, and descriptive summaries were generated. The association between menstrual knowledge, hygiene practices and sociodemographic variables was assessed using the chi-square test, with a 5% level of significance ($P = 0.05$).

Ethics considerations

This study was approved by the Bioethics Committee of the University of Chitral (BEC/23/172, dated 02/03/2023) and conducted in accordance with the Declaration of Helsinki. Verbal informed consent was obtained from the participants after they were provided with an explanation of the study's objectives, purpose and nature. Confidentiality of the data was ensured. All respondents were residents of the study area. Individuals who provided incomplete information were excluded from the study.

Results

Sociodemographic characteristics

Among the 520 respondents, 415 were Kho Muslims and 105 were Kalash. The median (IQR) age of the respondents was 20 years. The majority were single (71%) and lived mainly in nuclear families (67%). Most respondents were literate, with the highest percentage having attained college-level education or above (53%), followed by those with primary school education (41%) (Table 1).

Characteristics of menstruation among the respondents

The median (IQR) age of menarche was 14 years, the duration of blood flow was 5 days, and the menstrual cycle length was 28 days (Table 2). Most respondents (92%) reported regular cycles. The most reported menstrual symptoms were weakness (79%), dysmenorrhoea (64%), sleep problems (29%), anxiety (28%), headache (17%) and gastrointestinal problems (16%). Differences among the groups were statistically significant (Table 2).

Upon experiencing menarche, 86% of the respondents reported feeling scared, depressed, irritated or a combination of these emotions ($P < 0.0001$). While Kho respondents were primarily scared, Kalash respondents reported feeling depressed or irritated, with none reporting fear.

Statistically significant differences were observed among ethno-religious groups regarding social and domestic restrictions imposed during menstruation. Kho Muslims avoided prayers, fasting and other religious obligations, while Kalash women practised physical isolation in a purpose-built menstruation home called *bashalini* (Table 2).

Table 1 Sociodemographic characteristics of the Kho and Kalash women

Variable	Kho % (n)	Kalash % (n)	Total % (n)
Age category (years)**			
14–20	62 (256)	26 (27)	54 (283)
21–30	31 (127)	64 (67)	37 (194)
>30	8 (32)	10 (11)	8 (43)
Sum	100 (415)	100 (105)	100 (520)
Median age (interquartile range)	20 (10)	30 (10)	20 (10)
Marital status**			
Married	21 (87)	59 (62)	29 (149)
Single	79 (328)	41 (43)	71 (371)
Education**			
Illiterate	2 (8)	22 (23)	6 (31)
Primary school	54 (223)	49 (51)	53 (274)
College & higher	44 (184)	30 (31)	41 (215)
Mother's education**			
Illiterate	54 (223)	90 (95)	61 (318)
Literate	46 (192)	10 (10)	39 (202)
Family type*			
Nuclear	69 (287)	59 (62)	67 (349)
Extended	31 (128)	41 (43)	33 (171)
Family income (PKR)**			
10 000–50 000	35 (147)	79 (83)	44 (230)
50 000–100 000	52 (216)	16 (17)	45 (233)
>100 000	13 (52)	5 (5)	11 (57)

*$P < 0.05$; **$P < 0.0001$

Table 2 **Menstruation characteristics among Kho and Kalash women**

Variable	Kho % (n)	Kalash % (n)	Total % (n)
Age of menarche (years)*			
12	13 (54)	13 (14)	13 (68)
13	18 (74)	22 (23)	19 (97)
14	32 (131)	29 (30)	31 (161)
15	24 (99)	19 (20)	23 (119)
16	14 (57)	17 (18)	14 (75)
Sum	100 (415)	100 (105)	100 (520)
Median (interquartile range)	14 (2)	14 (2)	14 (2)
Duration of blood flow (days)*			
<3	1 (6)	1 (1)	1 (7)
3–7	97 (401)	98 (103)	97 (504)
>7	2 (8)	1 (1)	2 (9)
Median (interquartile range)	5 (3)	5 (2)	5 (3)
Duration of cycle (days)*			
<20	1 (4)	2 (2)	1 (6)
20–30	93 (386)	89 (94)	92 (480)
>30	6 (25)	9 (9)	7 (34)
Median (interquartile range)	28 (4)	28 (4)	28 (4)
Pattern of cycle*			
Regular	93 (386)	90 (94)	92 (480)
Irregular	7 (29)	10 (11)	8 (40)
Associated symptoms*			
Weakness	81 (338)	70 (73)	79 (411)
Dysmenorrhoea	66 (274)	54 (57)	64 (331)
Sleep problems	34 (140)	8 (8)	29 (148)
Anxiety	32 (134)	12 (13)	28 (147)
Headache	20 (82)	5 (5)	17 (87)
Gastrointestinal problems	18 (76)	9 (9)	16 (85)
No symptoms	20 (83)	25 (26)	21 (109)
Response on menarche*			
Scared	76 (315)	0 (0)	61 (315)
Irritated	79 (326)	60 (63)	74 (386)
Depressed	65 (268)	68 (71)	65 (339)
Normal	12 (49)	23 (24)	14 (73)
Restrictions during menstruation*			
Physical isolation	0 (0)	100 (105)	20 (105)
Avoid school	42 (174)	100 (105)	54 (279)
Avoid playing	41 (169)	54 (57)	43 (226)
Avoid sharing utensils	0 (0)	100 (105)	20 (105)
Avoid religious places	79 (327)	100 (105)	83 (432)
Avoid prayer/fasting	100 (415)	0 (0)	80 (415)
Source of information before menarche			
Friend	41 (119)	52 (55)	44 (174)
Media	28 (83)	0 (0)	21 (83)
Sister	11 (32)	19 (20)	13 (52)
Mother	5 (16)	29 (30)	12 (46)
Others	13 (42)	0 (0)	11 (42)

* $P < 0.0001$

Table 3 Knowledge about menstruation among Kho and Kalash women

Variable	Kho % (n)	Kalash % (n)	Total % (n)
Presumed cause*			
Physiological	62 (259)	1 (1)	50 (260)
Pathological	9 (38)	0 (0)	7 (38)
Clear impure blood	15 (63)	97 (102)	32 (165)
Don't know	13 (55)	2 (2)	11 (57)
Sum	100 (415)	100 (105)	100 (520)
Source of blood*			
Uterus	71 (296)	34 (36)	64 (332)
Vagina	13 (56)	54 (57)	22 (113)
Abdomen	2 (10)	1 (2)	2 (12)
Don't know	13 (53)	10 (10)	12 (63)
Awareness before menarche*			
Aware	70 (292)	100 (105)	76 (397)
Unaware	30 (123)	0 (0)	24 (123)
Awareness about hygiene before menarche*			
Aware	47 (194)	79 (83)	53 (277)
Unaware	53 (221)	21 (22)	47 (243)
Use of sanitation before menarche			
Aware	61 (254)	61 (64)	61 (318)
Unaware	39 (161)	39 (41)	39 (202)
Harmful to bathe 1st day of menses			
Yes	65 (270)	66 (69)	65 (339)
No	24 (99)	22 (21)	23 (120)
Don't know	11 (46)	14 (15)	12 (61)
Knowledge level (summary)			
Good	47 (195)	47 (49)	47 (252)
Poor	53 (220)	53 (56)	53 (276)

*$P < 0.0001$ (Chi-square test was used to compare the distribution between Kho and Kalash)

The main sources of information about menstruation before menarche were friends (44%), mass media (21%), elder sisters (13%) and others (22%), including mothers, elders, books and teachers.

Knowledge of menstruation

Statistically significant differences were observed between Kho and Kalash respondents regarding their understanding of the cause of menstruation ($P = 0.0001$). Approximately 62% of Kho respondents considered menstruation a physiological process, while 97% of Kalash respondents believed it to be a process for the removal of impure blood.

There was a significant difference in knowledge of the source of menstrual blood. 71% of Kho and 34% of Kalash respondents identified the uterus as the source, whereas 54% of Kalash respondents attributed it to the vagina ($P = 0.0001$). No significant difference was observed in knowledge of menstrual cycle duration; however, a significant difference was found in the understanding of cycle recurrence.

A significant difference was observed in awareness of menstruation and menstrual hygiene between the two ethno-religious groups ($P = 0.0001$). Approximately 70% of Kho respondents and 100% of Kalash respondents had knowledge of menstruation while 47% Kho respondents and 79% of Kalash respondents had some awareness of menstrual hygiene before menarche. However, no significant difference was observed in knowledge of menstrual sanitation between the 2 groups (Tables 3 and 5).

These findings indicate that menstrual knowledge varied based on ethno-religious background, as well as respondents' and their mother's education levels. Respondents aged 14–20 years demonstrated better menstrual knowledge. Educated females had nearly 4 times better knowledge (49%) than illiterate females (13%). Similarly, 52% of respondents with educated mothers had better knowledge, compared to 43% of those with illiterate mothers.

No significant differences in menstrual knowledge were observed across income groups ($P > 0.05$) (Table 5).

Table 4 Menstrual hygiene practices among Kho and Kalash women

Variable	Kho % (n)	Kalash % (n)	Total % (n)
Sanitary material			
Cloth	30 (126)	58 (61)	36 (187)
Pad	23 (94)	14 (15)	21 (109)
Both cloth and pad	38 (158)	19 (20)	34 (178)
Toilet paper	9 (37)	9 (9)	9 (46)
Sum	100 (415)	100 (105)	100 (520)
Disposal method*			
Waste bin	31 (130)	35 (37)	32 (167)
Open burning	29 (120)	17 (18)	27 (138)
Burning at designated site	28 (116)	41 (43)	31 (159)
Discarding in open/river	12 (49)	7 (7)	11 (56)
Wrapping material			
Plastic bag	82 (340)	82 (86)	82 (426)
Paper	10 (43)	12 (13)	11 (56)
Cloth	3 (14)	3 (3)	4 (21)
No wrapping	4 (18)	3 (3)	4 (21)
Drying of reusable sanitary materials*			
In open sunlight	0 (0)	100 (105)	20 (105)
Hidden	100 (415)	0 (0)	80 (415)
Frequency of underwear change*			
Daily	47 (193)	86 (90)	54 (283)
Alternate day	39 (162)	11 (12)	34 (174)
At the end of cycle	14 (60)	3 (3)	12 (63)
Changing sanitary materials on heaviest day*			
Always	66 (273)	81 (85)	69 (358)
Sometimes	27 (113)	18 (19)	25 (132)
Never	7 (29)	1 (1)	6 (30)
Washing body after changing sanitary material*			
Yes	78 (322)	90 (95)	80 (417)
No	22 (93)	10 (10)	20 (103)
Handwashing after changing sanitary material			
Yes	94 (390)	97 (102)	95 (492)
No	6 (25)	3 (3)	5 (28)
Bathing during menstruation			
Daily	40 (167)	39 (41)	40 (208)
Second day	42 (176)	36 (38)	41 (214)
Alternate day	13 (52)	22 (23)	14 (75)
At the end of cycle	5 (20)	3 (3)	4 (23)
Menstrual hygiene practices (summary)			
Good	46 (190)	90 (95)	55 (285)
Poor	54 (225)	10 (10)	45 (235)

*$P < 0.05$; **$P < 0.0001$ (Chi-square test was used to compare the distribution between Kho and Kalash)*

Table 5 **Association between demographic variables and menstrual knowledge and practices**

Variable		Knowledge score (Mean ± SD)	*P*	Practice score (Mean ± SD)	*P*
Ethnicity	Kho	3.36 ± 1.274	0.183	5.26 ± 1.38	< 0.0001
	Kalash	3.38 ± 1.013		6.86 ± 0.98	
Age group (years)	14–20	3.52 ± 1.221	0.006	5.47 ± 1.46	0.523
	21–30	3.16 ± 1.178		5.79 ± 1.41	
	>30	3.23 ± 1.324		5.37 ± 1.53	
Marital status	Married	3.18 ± 1.174	0.333	5.68 ± 1.49	0.170
	Single	3.44 ± 1.238		5.58 ± 1.46	
Education	College & higher	3.31 ± 1.257	0.039	5.68 ± 1.35	0.389
	School	3.49 ± 1.181		5.45 ± 1.53	
	Illiterate	2.61 ± 1.116		6.06 ± 1.36	
Mother's education	Literate	3.50 ± 1.282	0.137	5.79 ± 1.24	0.003
	Illiterate	3.28 ± 1.180		5.45 ± 1.58	
Family type	Nuclear	3.41 ± 1.209	0.462	5.60 ± 1.44	0.230
	Extended	3.36 ± 1.254		5.54 ± 1.51	
Family income (PKR)	10 000–50 000	3.24 ± 1.163	0.188	5.72 ± 1.42	0.035
	50 000–100 000	3.39 ± 1.289		5.33 ± 1.46	
	>100 000	3.74 ± 1.126		6.05 ± 1.42	

T-test and ANOVA were used to compare the knowledge and practice scores.

Menstrual hygiene practices

Overall, 55% of the respondents reported good menstrual hygiene. There was a significant difference between the ethno-religious groups; a higher proportion of Kalash respondents (90%) reported good practices than Kho Muslims (46%) (Table 4).

The sanitary materials used included cloth (36%), commercially available pads (21%), a combination of both (34%) and toilet paper (9%) ($P < 0.0001$). The methods of disposal of sanitary materials observed were burning (58%) and discarding (43%), wrapped in mostly plastic bags (82%). In 54% of cases, disposal was done properly by burning at designated sites or using waste collection bins (75%), whereas in another 54%, materials were burnt in open spaces or discarded in the wild or rivers (25%) ($P = 0.009$).

Regarding the reuse of sanitary materials, a significant difference was observed in drying methods among the ethno-religious groups ($P < 0.0001$). While all the Kalash respondents reported hanging reusable sanitary cloth and underwear in open sunlight for drying, Kho Muslims preferred drying them in concealed spaces. Among respondents, 54% changed underwear daily, 34% every alternate day and 12% only at the end of menstruation. Sixty-nine percent reported changing sanitary materials at night on the first day of menstruation, and 95% practised handwashing after changing sanitary materials (Table 4).

A significant difference was observed in menstrual practices between Kalash and Kho respondents ($P < 0.0001$), with Kalash scoring higher. A similar trend was observed between respondents with literate and illiterate mothers ($P = 0.003$), where those with literate mothers scored higher. No significant differences were found across age groups, education levels, family type, family income, or marital status. Respondents aged 14–20 years, illiterate individuals and those with the highest income level (≥PKR 100 000) scored the highest in terms of good practices (Table 5).

Discussion

Culture and religion have a profound influence on menstrual practices worldwide. They factors shape menstrual hygiene behaviours, which significantly impact women's physical and emotional health (*5,15*). Adequate knowledge of menstruation and menstrual health plays a crucial role in women's overall wellbeing. This study, conducted in Chitral Valley, Pakistan, provides valuable insight by identifying knowledge gaps and areas for improvement. Maintaining proper menstrual hygiene reduces the risk of infections and other health complications. Exploring menstrual beliefs and practices can help uncover cultural and social factors that influence hygiene behaviours, thus informing the design of culturally sensitive and effective interventions

The study included 520 Kho and Kalash females from the Hindukush ranges of northwestern Pakistan. The median (IQR) age of menarche was 14 (2) years, which is higher than reports from India (mean age 12.84 ± 1.4 years), Saudi Arabia (12.29 ± 1.04 years) and Canada (12.72 years) (*15–17*). Approximately 8% of respondents experienced irregular menstrual cycles, which is significantly lower than the 14% reported in a Korean population (*18*). Irregular cycles have been linked to smoking, work-

related stress and marital status. Dysmenorrhoea was reported by 64% of respondents, which was lower than in Saudi Arabia (95%) but higher than in Turkey (55%) (*19,20*). Risk factors for dysmenorrhoea include younger age, stress and smoking (*20,21*). Since 64% of respondents were aged 20 years or below, the higher prevalence of dysmenorrhoea may be age-related.

Significant differences were observed in responses to menarche between the ethno-religious groups. Unlike the Kho respondents, none of the Kalash reported feeling scared upon experiencing menarche; instead, they described feelings of irritation, anxiety, or depression. This is attributed to the presence of the *bashalini*, where young Kalash girls assist menstruating women by bringing food and other necessities, allowing them to learn about menstruation from an early age. The restrictions observed in this study are rooted in cultural and religious beliefs. Kalash females spend their menstrual period in the *bashalini*, segregated from their families (*12,13*).

This study found that 47% of the participants had good knowledge of menstruation and hygiene before menarche, which is lower than earlier fundings in Nepal (88%), Indonesia (67%) and Afghanistan (53%) (*22–24*). The primary sources of information were friends (44%), mass media (21%), sisters (13%) and others (22%), which is consistent with reports from Egypt and India (25,26). All Kalash respondents and 70% of Kho respondents had knowledge of menstruation before menarche, which may again be attributed to the *bashalini* tradition (*11–13*). Similarly, 79% of Kalash respondents had prior knowledge of menstrual hygiene, compared to approximately 47% of Kho respondents. Ninety-seven percent of Kalash respondents believed menstruation was a process of removing impure blood, while 62% of Kho respondents understood it as a physiological process. The Kalash belief is strongly associated with the cultural concept of *pragata*, where females are segregated during menstruation due to being considered impure. A significantly higher proportion of Kalash respondents identified the vagina as the source of menstrual blood, while most Kho respondents attributed it to the uterus. The education levels of respondents and their mothers likely influenced this knowledge, as 98% of Kho respondents were educated (46% had educated mothers), compared to 78% of Kalash respondents (with only 2% having educated mothers).

This study revealed that 55% of respondents practised good menstrual hygiene. The use of sanitary materials varied significantly between the 2 groups, with financial constraints influencing the choice of materials. Although respondents recognised pads as better absorbents, affordability limited their use. For instance, 72% of respondents from households earning ≥PKR 100 000 used sanitary pads. The study also highlighted differences in drying practices, with Kalash respondents benefiting from the open and safe environment of the *bashilini* for hygienic drying, while Kho respondents preferred concealed methods. As Wynne Maggi describes in her book *Our women are free*, the *bashalini* is an important Kalash institution, managed by women, serving as a space for cultural and community activities, religious rituals and discussions about sexuality, marriage and reproduction, away from the social pressures of village life (*11– 13*).

A positive association was observed between mothers' education levels and good menstrual hygiene practices, consistent with previous studies that highlight the importance of education in shaping hygiene behaviours (*16*). Approximately 57% of respondents burned used sanitary materials, while 43% disposed of them in waste bins or other locations. However, about 51% of those who burned materials did so in open spaces, contributing to environmental pollution. For disposal, 82% used polythene bags. Among those who discarded materials, 25% practised unhygienic disposal by discarding them in rivers, wild spaces, or uninhabited areas. This poses a threat to the environment and wildlife, particularly in Chitral, where waste collection bins are inaccessible to much of the dispersed population. Authorities must address this issue by providing adequate waste collection and disposal facilities.

Limitations of the study

Several limitations should be considered. Consent approval and subject recruitment relied on local resource persons, and in some remote areas, their recruitment was challenging due to linguistic, cultural and logistical barriers. As with other quantitative studies, self-reported data may be subject to inaccuracies or desirability bias. The Kalash sample size was relatively small, limiting the generalisation of findings to other ethnic groups in Pakistan due to cultural and socioeconomic differences. Despite these limitations, this study provides valuable insights into a geographically and culturally isolated population.

A key strength of this study was the involvement of local female researchers/enumerators, who belonged to the Kho and Kalash ethnic groups. Their understanding of cultural sensitivities and direct access to menstrual homes in the Kalash valleys significantly contributed to the study's depth and reliability.

Implications of the study

The findings of this study have important policy and public health implications. Improving menstrual health can reduce associated health risks, such as infections and discomfort, while expanding access to affordable sanitary products and private washing facilities is essential for promoting better hygiene practices. Integrating menstrual health education into school curricula is crucial for addressing knowledge gaps, countering cultural misconceptions and promoting healthier practices. Moreover, establishing proper waste disposal systems can help mitigate environmental threats linked to menstrual hygiene management.

Although respondents recognised sanitary pads as the superior option, financial constraints limited their use. Improving access to affordable sanitary products could significantly improve menstrual hygiene practices.

Conclusion

Knowledge of menstruation and hygiene was found to be suboptimal among these population groups, underscoring the need for increased awareness and education on menstrual hygiene practices. While menstrual hygiene practice score was low among Kho respondents, Kalash respondents scored higher, likely due to the safe environment and space provided by bashalini in Kalash valleys. The findings of this study could be crucial for improving menstrual health, reducing stigma and promoting gender equality. They may also provide a foundation for evidence-based interventions and policies that can make a significant difference in women's lives.

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Évaluation des connaissances, croyances et pratiques d'hygiène concernant la menstruation au sein des groupes ethniques dans les populations isolées au Pakistan

Résumé

Contexte : Les connaissances relatives à la menstruation et à l'hygiène menstruelle ont un impact significatif sur la santé des femmes et sont souvent influencées par des facteurs économiques, culturels et religieux.

Objectif : Évaluer les connaissances en matière de menstruation et d'hygiène menstruelle parmi les groupes ethniques Kho et Kalash dans le district de Chitral (Pakistan).

Méthodes : Entre mai et septembre 2023, la présente étude transversale a permis de recueillir des données dans ces deux domaines auprès de 415 femmes Kho et 105 femmes Kalash au Pakistan. Les données ont été analysées à l'aide du logiciel SPSS version 22 et les associations entre les facteurs variables ont été évaluées au moyen du test du khi carré ($p < 0,05$).

Résultats : Les répondantes âgées de 14 à 20 ans avaient de meilleures connaissances sur la menstruation que les personnes âgées, et les femmes instruites étaient près de quatre fois plus informées que les femmes analphabètes (49 % contre 13 %). Les personnes interrogées dont les mères étaient éduquées avaient des connaissances plus approfondies que celles dont les mères étaient analphabètes (52 % contre 43 %, $p = 0,003$). Une différence significative dans les pratiques d'hygiène menstruelle a été observée entre les femmes Kalash et Kho ($p < 0,0001$) ; les femmes Kalash ont déclaré adopter de meilleures pratiques que celles du groupe ethnique Kho (90 % contre 46 %). Les principales sources d'information sur la menstruation avant les premières règles étaient les amis (44 %), les médias de masse (21 %) et les sœurs aînées (13 %).

Conclusion : Les connaissances sur la menstruation et l'hygiène menstruelle sont insuffisantes au sein de la population d'étude. Il est donc nécessaire de mettre en place des interventions et des politiques ciblées afin de renforcer les connaissances et les pratiques associées, ce qui permettra d'améliorer la santé menstruelle des femmes.

المعلومات والمعتقدات والممارسات المتعلقة بالحيض والنظافة الشخصية في أثناء الدورة الشهرية بين نساء خو وكالاش في باكستان

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الخلاصة

الخلفية: تؤثر المعلومات المتداوَلة بشأن الدورة الشهرية والنظافة الشخصية في أثناء الدورة الشهرية تأثيرًا كبيرًا على صحة المرأة، وغالبًا ما تتأثر بالعوامل الاقتصادية والثقافية والدينية.

الأهداف: هدفت هذه الدراسة الى تقييم المعلومات المتداوَلة بشأن الدورة الشهرية والنظافة الشخصية في أثناء الدورة الشهرية بين المجموعتين العِرْقيتين خو وكالاش في شيترال، باكستان

طرق البحث: من مايو/ أيار إلى سبتمبر/ أيلول 2023، جَمعت هذه الدراسة المقطعية بيانات عن المعلومات المتداولة بشأن الدورة الشهرية والنظافة الشخصية في أثناء الدورة الشهرية من 415 امرأة من خو، و105 نساء من كالاش في باكستان. وحُللت البيانات بالإِصْدار 22 من برنامج SPSS، وحُللت العلاقات بين العوامل المُتَغَيِّرة باختبار كاي تربيع (القيمة الاحتمالية < 0.05).

النتائج: تبين أن المشاركات في الدراسة اللاتي تتراوح أعمارهنَّ بين 14–20 عامًا لديهن معرفة أفضل بالدورة الشهرية من البالغات الأكبر سنًّا، وكانت النساء المُتعلمات أكثر معرفة بنحو 4 مرات من النساء الأميات (49٪ مقابل 13٪). والمشاركات اللاتي لديهن أمهات مُتعلمات كانت

معرفتهن عن الدورة الشهرية أفضل مقارنة بالمشاركات اللاتي لهن أمهات أُميات (52٪ مقابل 43 ٪، القيمة الاحتمالية = 0.003). وكان ثمة فرق كبير في ممارسات النظافة الشخصية في أثناء الدورة الشهرية بين نساء كالاش والخو (القيمة الاحتمالية < 0.0001)؛ وأبلغت نساء كالاش عن ممارسات أفضل من نساء خو المسلمات (90 ٪ مقابل 46 ٪). وكانت المصادر الرئيسية لمعلومات الإناث عن الدورة الشهرية قبل بداية الدورة الشهرية لهن هي الأصدقاء (44 ٪)، ووسائل الإعلام (21 ٪)، والأخوات الأكبر سنًّا (13 ٪).

الاستنتاجات: إن المعلومات السائدة عن الدورة الشهرية والنظافة الشخصية في أثناء الدورة الشهرية ضعيفة بين مجتمع الدراسة، ما يشير إلى الحاجة إلى تدخُّلات وسياسات موجَّهة لتحسين تلك المعلومات وممارسات النظافة، وبالتالي تحسين الصحة في أثناء دورة الحيض بين النساء.

References

1. Mahon T, Fernandes M. Menstrual hygiene in South Asia: a neglected issue for WASH (water, sanitation and hygiene) programmes. Gend Dev. 2010;18(1):99–113. doi:10.1080/13552071003600083
2. Hennegan J, Winkler IT, Bobel C, Keiser D, Hampton J, Larsson G, et al. Menstrual health: a definition for policy, practice, and research. Sex Reprod Health Matters. 2021;29(1):1911618. doi:10.1080/26410397.2021.1911618
3. UNICEF. Guidance on menstrual health and hygiene. New York: UNICEF; 2019. (http://www.unicef.org/wash)
4. Sommer M, Daly G, Kabiru C, Lhaki P, Okwaro N, Chandra-Mouli V. Strengthening health care worker engagement with early adolescence in low- and middle-income countries: an overdue area for action. Int J Adolesc Med Health. 2020;1. doi:10.1515/ijamh-2019-0171.
5. van Eijk AM, Sivakami M, Thakkar MB, Bauman A, Laserson KF, Coates S, et al. Menstrual hygiene management among adolescent girls in India: a systematic review and meta-analysis. BMJ Open. 2016;6(3):e010290. doi:10.1136/bmjopen-2015-010290
6. Eisenlohr-Moul T. Premenstrual disorders: a primer and research agenda for psychologists. Clin Psychol Sci Pract. 2019;72(1):5–17. doi:10.1111/cpsp.12284
7. Elledge M, Muralidharan A, Parker A, Ravndal KT, Siddiqui M, Toolaram AP, et al. Menstrual hygiene management and waste disposal in low- and middle-income countries: a review of the literature. Int J Environ Res Public Health. 2018;15(11):2562. doi:10.3390/ijerph15112562.
8. Walker BG. Man made God: a collection of essays. Seattle (WA): Stellar House Publishing; 2010.
9. Chawla J. The mythic origins of the menstrual taboo in the Rig Veda. Econ Polit Wkly. 1994;29(43):2817–25.
10. Shostak M. Nisa: the life and words of a !Kung woman. Cambridge (MA): Harvard University Press; 1981.
11. Wynne M. Our women are free: gender and ethnicity in the Hindukush. Ann Arbor (MI): University of Michigan Press; 2001.
12. Anwaar M, Sheikh I, Hafeez-Ur-Rehman C. Bashalini: a place for biological gender impurities segregating women during menstruation in Kalsah. Sci Int. 2015;27(1):549–54.
13. Ali M. A historical narrative of the bashali: the menstrual house as cultural identity of the Kalasha women of the Hindu Kush. J Res Soc Pak. 2020;57(3):204–18.
14. Census of Pakistan. Data from district-wise census results, Census 2017. Islamabad: Bureau of Statistics, Government of Pakistan; 2017.
15. Al-Mutairi H, Jahan S. Knowledge and practice of self-hygiene during menstruation among female adolescent students in Buraidah city. J Family Med Prim Care. 2021;10(4):1569–75. doi:10.4103/jfmpc.jfmpc_2321_20.
16. Sachan B, Kumari R, Singh A, Idris M, Jain S. Age at menarche and menstrual problems among school-going adolescent girls of a North Indian district. J Basic Clin Reprod Sci. 2012;1(1):56–9. doi:10.4103/2278-960X.104298.
17. Al-Sahab B, Ardern CI, Hamadeh MJ, Tamim H. Age at menarche in Canada: results from the national longitudinal survey of children & youth. BMC Public Health. 2010;10:736. doi:10.1186/1471-2458-10-736.
18. Jung EK, Kim SW, Ock SM, Song CH. Prevalence and related factors of irregular menstrual cycles in Korean women: the 5th Korean national health and nutrition examination survey (KNHANES-V, 2010–2012). J Psychosom Obstet Gynaecol. 2018;39(3):196–202. doi:10.1080/0167482X.2017.1321631.
19. Bakhsh H, Algenaimi E, Aldhuwayhi R, Abuwadaan M. Prevalence of dysmenorrhea among reproductive age group in Saudi women. BMC Women's Health. 2022;22(1):78. doi:10.1186/s12905-022-01654-9.
20. Ozerdogan N, Sayiner D, Ayranci U, Unsal A, Giray S. Prevalence and predictors of dysmenorrhea among students at a university in Turkey. Int J Gynaecol Obstet. 2009;107(1):39–43. doi:10.1016/j.ijgo.2009.05.010.
21. Ju H, Jones M, Mishra G. The prevalence and risk factors of dysmenorrhea. Epidemiol Rev. 2014;36(1):104–13. doi:10.1093/epirev/mxt009.
22. Bhusal CK. Practice of menstrual hygiene and associated factors among adolescent school girls in Dang district, Nepal. Adv Prev Med. 2020;2020:1292070. doi: 10.1155/2020/1292070.

23. Andani PR. Knowledge, attitude and practice of menstrual hygiene among primary school adolescents in Surabaya, Indonesia. Indian J Forensic Med Toxicol. 2020;14(3):1109–14. doi:10.37506/ijfmt.v14i3.10522.

24. Neyazi A, Faizi G, Afzali H, Ahmadi M, Razaqi N, Frough Z, et al. Assessment of knowledge, attitude and practice about the menstruation among secondary school girls in Herat, Afghanistan – a cross-sectional study. 2021. doi:10.21203/rs.3.rs-847912/v1.

25. El-Gilany A, Badawi K, El-Fedawy S. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. Reprod Health Matters. 2005;13(26):147–52. doi:10.1016/S0968-8080(05)26191-8.

26. Bhattacherjee S, Ray K, Biswas R, Chakraborty M. Menstruation: experiences of adolescent slum dwelling girls of Siliguri city, West Bengal, India. J Basic Clin Reprod Sci. 2013;2(2):85–91. doi:10.4103/2278-960X.118646