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Period poverty among women after the 2023 Kahramanmaraş Earthquake in Turkey – a cross-sectional study

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Abstract

Introduction and Objective. Menstrual poverty lies at the intersection of poverty, sustainability, reproductive rights, and gender inequality. The study investigates menstrual poverty among women affected by the 2023 earthquake in Turkey.

Materials and Method. A descriptive cross-sectional study was conducted between 24 April – 24 May 2023 with 400 women impacted by the earthquake. Data were collected via social media using a survey form. Chi-square tests, Bonferroni test, and binary logistic regression model were used for statistical analysis.

Results. The mean age of participants was 27.27 ± 8.40 years; 69.5% had higher education, 57.0% lived in urban areas, and 90.5% had no chronic disease. A significant relationship was found between access to menstrual products and basic needs (clean water, toilet paper, soap, safe toilet access, and healthcare) during menstruation after the earthquake ($p<0.05$). A significant correlation was also observed between disruptions to the menstrual cycle and the following variables: lack of privacy, perception that lack of privacy affected menstruation, healthcare access, and difficulty obtaining menstrual products ($p<0.05$).

Conclusions. Most participants faced difficulties accessing menstrual products, water, hygiene supplies, privacy, and healthcare. Those living in tents or containers reported greater challenges. These barriers contributed to menstrual poverty and impacted women's cycles. As menstrual health and hygiene are basic needs and human rights, menstrual poverty must be addressed globally.

Key words

period poverty, menstruation, women, hygiene, earthquake

INTRODUCTION

Numerous natural disasters which led to human deaths and injuries, such as volcanic eruptions, earthquakes, floods, hurricanes, droughts, and wildfires, occur worldwide [1]. Turkey has experienced two large earthquakes, natural disasters that resulted in significant loss of life and are sadly remembered in history. It was reported that 48,448 people died, and more than 115,000 people were injured in the two earthquakes that occurred on 6 February 2023, with an epicentre in Kahramanmaraş province of Turkey [2]. Research studies state that a larger number of women died in the earthquakes [3, 4]. Also, initial data from the earthquake in 2023 indicate that more than half (52.8%) of those receiving treatment in hospitals were women [4]. Due to natural disasters, women have higher percentages of injuries and deaths [5]. Women who surviving the disaster are striving to meet their primary needs, such as accommodation, clothing, hygiene, access to clean water and foodstuff, and life safety [6].

Menstruation is a physiological process experienced by approximately 1.8 billion women worldwide every month, from menarche to menopause. According to the Global Menstrual Collective's Terminology Action Group, menstrual health has been defined as 'a state of complete physical, mental and social well-being, not just the absence of disease or disability related to the menstrual cycle' [7]. Menstrual poverty is the lack of access to menstrual products, such as sanitary pads, tampons, and such basic needs as clean water, arubbish bin, and a clean, safe toilet (or room), that facilitate self-care for people who menstruate [8]. Although menstrual poverty is often associated with low-income countries, in fact it is a global issue that affects women's health, education, work, and social lives, largely due to gender norms and inequalities. Research indicates that access to menstrual products is closely tied to economic status, with financial barriers limiting availability [9].

Women often face challenges in accessing menstrual health services. Limited education reduces awareness of

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menstruation and the proper use of sanitary products, making it more difficult for women to recognize menstrual health concerns and take necessary precautions [10]. Menstrual poverty is a complex social issue at the intersection of poverty reduction, sustainability, reproductive rights, and gender inequality. It arises from a wide range of social, economic, and environmental factors. Humanitarian crises, pandemics, and natural disasters can further intensify these challenges, deepening the poverty and increasing the risks and impacts associated with menstrual health and well-being [7, 8].

Along with natural disasters, women can be confronted with challenges during the menstruation period, such as limited access to water, period products, sanitation, and health centres [11]. Women and girls living in unofficial shelters face significant challenges, including the inability to use toilets at night due to inadequate privacy and hygiene conditions. Toilets are often located far from the tents, poorly lit, and lacking necessary privacy. Additionally, the absence of showers in these shelters poses a serious threat to female health, further exacerbating the challenges they face in maintaining personal hygiene. When this situation is combined with poverty and the urban-rural divide, the gender inequality among women in rural areas is exacerbated even further during and after a disaster [12].

Women were undoubtedly among the groups most affected by the 2023 earthquake in Turkey. In the aftermath of the earthquake, women experienced difficulties in accessing period products, water, sanitation, and safe spaces during the menstruation. There was no study addressing the period poverty of women under insecure accommodation conditions in the disaster zone in connection with women's bodily and subjective perceptions. The aim of the study is to research the period poverty of women affected by the earthquake of 2023 in Turkey.

MATERIALS AND METHOD

The study was descriptive and cross-sectional. Data was collected via an online survey, between 24 April – 24 May 2023 from women residing in 11 Turkish provinces affected by the earthquake who voluntarily participated in the study. As they belong to a hard-to-reach population, data was collected using the snowball sampling method, allowing participants to recruit others from their networks.

Study population. and sample selection. The study population consisted of women aged 18 and over who were affected by the earthquake in Kahramanmaraş, Gaziantep, Hatay, Adana, Adıyaman, Elâzığ, Diyarbakır, Kilis, Malatya, Osmaniye and Şanlıurfa. As noted in many reports, there is no exact prevalence rate for menstrual deprivation during disasters. Aditionally, as the total population affected by the disaster is not precisely known and the affected population is quite large, the sample size in this study was calculated using the sample size formula for an unknown population. Assuming a possible prevalence of menstrual deprivation during disasters to be 50% (p=0.5) and allowing for a 5% margin of error (d=0.05), it was calculated that a minimum of 384 participants would be required for the study with a 95% confidence level. The study was completed with 400 participants. Inclusion criteria: women in age >18 years, agreeing who agreed to participate in the study; experiencing a menstrual period after the earthquakes; access to social media networks. Women who did not met inclusion criteria were excluded from the study.

Data collection. Data were collected via a questionnaire developed by the researchers in line with the relevant literature. The questionnaire consisted of 25 questions designed to collect specified socio-demographic characteristics and menstrual hygiene characteristics of women who experienced the earthquake that occurred in Turkey in 2023 [4, 6, 12]. A pilot study was conducted with 20 women to assess the comprehensibility of the questionnaire.

Data were collected from among 400 women online, using a Google Forms survey distributed via social media. Researchers shared the survey link across various platforms at different times (weekdays, weekends, daytime, evenings) to maximize outreach. Participants received detailed information about the study and indicated informed consent on the first page of the form. Participation was voluntary, with the right to withdraw at any time. Confidentiality was strictly maintained – data were securely stored in a digital environment and accessible only through the researchers' designated Google account. The survey took approximately 5–10 minutes to complete, and respondents were encouraged to share the link with other eligible women.

Data analysis. Analyses were performed using the IBM SPSS Statistics package 26. Chi-square analysis was used to examine the relationship between two independent categorical variables. If a significant relationship was identified in the chi-square analysis, Bonferroni-corrected results were used to determine the specific group responsible for the relationship. To indicate the source group, letter indices (e.g., a, b, c) were assigned in accordance with the notation format of the IBM SPSS Statistics 26 software and displayed in Tables. A binary logistic regression model was used to examine the effects of the variables on the menstrual cycle following the earthquake. The model was found to be statistically significant ($p<0.05$).

Ethical approval. Ethical approval for the study was obtained on 24 April 2023 from Istanbul Gedik University Scientific Research and Publication Ethical Committee (2023/483; No: E-56365223-050.02.04-2023.137548.91-483).

RESULTS

The mean age of the women was 27.27 ± 8.40 years. Among all the participating women, 69.5% had an undergraduate or a higher degree, 30.3% were working, 57% lived in the centre of the province, 38% lived in a house, and 90.5% had no chronic or systemic disease (Tab. 1).

The Table shows that there is a statistically significant relationship between place of residence and daily access to menstrual products after the earthquake (p=0.023). Accordingly, the rate of those living in the province is statistically significantly lower than that of those living in towns/villages (Tab. 2).

As shown in the table, the results of the chi-square analysis indicate a statistically significant relationship between place of residence and several factors related to menstrual health after the earthquake. These factors include difficulty in

Table 1. Socio-demographic characteristics of the surveyed women (n=400)

Descriptive characteristics	Mean ± SD	
Age (year)	27.27 ± 8.40	
	n	**%**
Education level		
Primary school	56	14.0
High school	66	16.5
Undergraduate programme or above	278	69.5
Employment status		
Yes	121	30.3
No	279	69.7
Place of residence		
Provincial centre	228	57.0
District centre	97	24.3
Town/village	75	18.7
Housing unit		
Relative's house	90	22.5
House	152	38.0
Guest house	14	3.5
Container	94	23.5
Tent	28	7.0
Other *	22	5.5
Status of having a chronic / systemic disease		
No	362	90.5
Yes	38	9.5
Total	**400**	**100.0**

***** Student dormitory, camper trailer

Table 2. Women's place of residence and necessary materials and conditions during the post-earthquake menstrual period (n=400)

		PROVİNCE		DİSTRİCT		VİLLAGE/TOWN		Chi-Square	p
Question	Answer	N	%	N	%	N	%		
Difficulty accessing Daily menstrual products after the earthquake	Yes	148	64.9_{a}	63	$64.9_{a,b}$	61	81.3_{b}	7.542	0.023*
	No	80	35.1_{a}	34	$35.1_{a,b}$	14	18.7_{b}		
Access to clean water during menstruation after the earthquake	Always	54	23.7	23	23.7	11	14.7	11.105	0.085
	Frequently	57	25.0	23	23.7	11	14.7		
	Rarely	80	35.1	37	38.1	32	42.7		
	Never	37	16.2	14	14.4	21	28.0		
Access to soap during menstruation after the earthquake	Always	74	32.5	33	34.0	17	22.7	10.126	0.119
	Frequently	56	24.6	25	25.8	15	20.0		
	Rarely	62	27.2	29	29.9	23	30.7		
	Never	36	15.8	10	10.3	20	26.7		
Having access to a toilet where one can feel safe during menstruation after the earthquake	Always	51	22.4	27	27.8	12	16.0	9.519	0.146
	Frequently	53	23.2	20	20.6	17	22.7		
	Rarely	84	36.8	35	36.1	23	30.7		
	Never	40	17.5	15	15.5	23	30.7		
Access to clean toilet paper during menstruation after the earthquake	Always	61	26.8	30	30.9	13	17.3	10.741	0.097
	Frequently	44	19.3	25	25.8	15	20.0		
	Rarely	59	25.9	27	27.8	26	34.7		
	Never	64	28.1	15	15.5	21	28.0		
Feeling lack of privacy during menstruation after earthquake	Always	40	17.5	14	14.4	14	18.7	6.195	0.402
	Frequently	57	25.0	21	21.6	10	13.3		
	Rarely	57	25.0	25	25.8	25	33.3		
	Never	74	32.5	37	38.1	26	34.7		
Effects of lack of privacy on menstrual regularity during post-earthquake menstrual period	Always	28	12.3	14	14.4	10	13.3	10.847	0.093
	Frequently	63	27.6	27	27.8	11	14.7		
	Rarely	61	26.8	23	23.7	32	42.7		
	Never	76	33.3	33	34.0	22	29.3		
Access to any health Institution during the menstrual period after the earthquake	Always	63	27.6	17	17.5	11	14.7	11.436	0.076
	Frequently	41	18.0	17	17.5	10	13.3		
	Rarely	67	29.4	40	41.2	32	42.7		
	Never	57	25.0	23	23.7	22	29.3		
Difficulty obtaining menstrual products after earthquake	Always/ Often	54	23.7	24	24.7	20	26.7	5.807	0.214
	Rarely	104	45.6	38	39.2	40	53.3		
	Never	70	30.7	35	36.1	15	20.0		

*: $p<0.05$. The letters a, b, c, indicate the group from which the relationship originates. There is no relationship in ratios containing the same letters

accessing daily menstrual products (p=0.000), access to clean water during the menstrual period (p=0.000), access to soap during the menstrual period (p=0.000), access to a toilet where one can feel safe during the menstrual period (p=0.000), access to clean toilet paper during the menstrual period(, p=0.000), feeling of lack of privacy during the post-earthquake menstrual period (p=0.000), the impact of lack of privacy on menstrual regularity (p=0.000), access to any health facility during the post-earthquake menstrual period (p=0.000), and difficulty in obtaining menstrual products after the earthquake (p=0.000). Moreover, the rate of women living in relatives' houses is statistically significantly lower than the rate of women living in containers. The rate of those living at home is statistically significantly lower than those living in containers and tents/other places (Tab. 3).

On examining the result of the chi-square analyses in Table, it was noted that there is a statistically significant relationship between the status of the menstrual cycle affected after the earthquake, and the following variables:

- difficulty in accessing daily menstrual products (p=0.000);
- access to clean water during the menstrual period (p=0.049);
- access to soap during the menstrual period (p=0.001);
- access to a toilet where one can feel safe during the menstrual period (p=0.000);
- access to clean toilet paper during the menstrual period (p=0.000);
- feeling lack of privacy in the menstrual period (p=0.000);
- lack of privacy in the menstrual period, affecting menstrual regularity (p=0.000);
- access to any health institution in the menstrual period after the earthquake (p=0.000);
- difficulty in obtaining menstrual products (p=0.000) (Tab. 4).

Table 3. The place of living and the necessary materials and conditions during the post earthquake menstrual period (n=400)

		Relatives' House		House		Container		Tent/Other		Chi-square	p
Question	Answer	N	%	N	%	N	%	N	%		
Difficulty accessing daily menstrual products	Yes	55	$61.1_{a,b}$	83	54.6_{b}	84	89.4_{c}	50	$78.1_{a,c}$	37.223	0.000*
	No	35	$38.9_{a,b}$	69	45.4_{b}	10	10.6_{c}	14	$21.9_{a,c}$		
Access to clean water during menstruation	Always	20	22.2_{a}	61	40.1_{b}	3	3.2_{c}	4	6.3_{c}	96.690	0.000*
	Frequently	30	33.3_{a}	39	$25.7_{a,b}$	12	12.8_{b}	10	$15.6_{a,b}$		
	Rarely	30	$33.3_{a,b}$	40	26.3_{b}	46	48.9_{a}	33	51.6_{a}		
	Never	10	$11.1_{a,b}$	12	7.9_{b}	33	35.1_{c}	17	$26.6_{a,c}$		
Access to soap during menstruation	Always	35	38.9_{a}	73	48.0_{a}	7	7.4_{b}	9	14.1_{b}	151.219	0.000*
	Frequently	27	30.0_{a}	48	31.6_{a}	7	7.4_{b}	14	$21.9_{a,b}$		
	Rarely	23	$25.6_{a,b}$	25	16.4_{b}	35	$37.2_{a,c}$	31	48.4_{c}		
	Never	5	$5.6_{a,b}$	6	3.9_{b}	45	47.9_{c}	10	15.6_{a}		
Having access to a toilet where one can feel safe during menstruation	Always	18	20.0_{a}	63	41.4_{b}	3	3.2_{c}	6	$9.4_{a,c}$	100.631	0.000*
	Frequently	28	31.1_{a}	42	27.6_{a}	10	10.6_{b}	10	$15.6_{a,b}$		
	Rarely	31	$34.4_{a,b}$	36	23.7_{b}	48	51.1_{a}	27	42.2_{a}		
	Never	13	14.4_{a}	11	7.2_{a}	33	35.1_{b}	21	32.8_{b}		
Access to clean toilet paper during menstruation	Always	29	$32.2_{a,b}$	62	40.8_{b}	4	4.3_{c}	9	$14.1_{a,c}$	128.740	0.000 *
	Frequently	22	$24.4_{a,b}$	40	26.3_{b}	10	10.6_{a}	12	$18.8_{a,b}$		
	Rarely	29	$32.2_{a,b}$	36	23.7_{b}	20	21.3_{b}	27	42.2_{a}		
	Never	10	$11.1_{a,b}$	14	9.2_{b}	60	63.8_{c}	16	25.0_{a}		
Feeling lack of privacy during menstruation	Always	4	4.4_{a}	17	$11.2_{a,b}$	31	33.0_{c}	16	$25.0_{b,c}$	61.015	0.000*
	Frequently	23	$25.6_{a,b}$	21	13.8_{b}	31	33.0_{a}	13	$20.3_{a,b}$		
	Rarely	27	30.0_{a}	43	28.3_{a}	17	18.1_{a}	20	31.3_{a}		
	Never	36	$40.0_{a,b}$	71	46.7_{b}	15	16.0_{c}	15	$23.4_{a,c}$		
Effects of lack of privacy on menstrual regularity	Always	6	6.7_{a}	13	8.6_{a}	19	20.2_{b}	14	21.9_{b}	66.842	0.000*
	Frequently	20	22.2_{a}	20	13.2_{a}	43	45.7_{b}	18	$28.1_{a,b}$		
	Rarely	24	26.7_{a}	52	34.2_{a}	19	20.2_{a}	21	32.8_{a}		
	Never	40	44.4_{a}	67	44.1_{a}	13	13.8_{b}	11	17.2_{b}		
Access to any health institution during menstruation	Always	21	23.3_{a}	46	30.3_{a}	8	8.5_{b}	16	25.0_{a}	36.549	0.000*
	Frequently	13	14.4_{a}	35	23.0_{a}	13	13.8_{a}	7	10.9_{a}		
	Rarely	30	33.3_{a}	33	21.7_{a}	51	54.3_{b}	25	$39.1_{a,b}$		
	Never	26	28.9_{a}	38	25.0_{a}	22	23.4_{a}	16	25.0_{a}		
Difficulty obtaining menstrual products after the earthquake	Always / Often	11	12.2_{a}	24	15.8_{a}	40	42.6_{b}	23	35.9_{b}	51.115	0.000*
	Rarely	50	55.6_{a}	61	40.1_{a}	41	43.6_{a}	30	46.9_{a}		
	Never	29	$32.2_{a,b}$	67	44.1_{b}	13	13.8_{c}	11	$17.2_{a,c}$		

*:p<0.05. The letters a, b, c indicate the group from which the relationship originates. There is no relationship in relationships containing the same letters

Table 4. Post-earthquake menstrual cycle of women and the materials and conditions required during the post-earthquake menstruation (n=400)

		Menstrual Cycle Affected		Menstrual Cycle Not Affected		Chi-Square	p
Question	Answer	Number	%	Number	%		
Difficulty accessing daily menstrual products	Yes	202	76.2$_a$	70	51.9$_b$	24.419	0.000*
	No	63	23.8$_a$	65	48.1$_b$		
Access to clean water during menstruation	Always	50	18.9$_a$	38	28.1$_b$	7.862	0.049*
	Frequently	57	21.5$_a$	34	25.2$_a$		
	Rarely	110	41.5$_a$	39	28.9$_b$		
	Never	48	18.1$_a$	24	17.8$_a$		
Access to soap during menstruation	Always	71	26.8$_a$	53	39.3$_b$	16.526	0.001*
	Frequently	56	21.1$_a$	40	29.6$_a$		
	Rarely	85	32.1$_a$	29	21.5$_b$		
	Never	53	20.0$_a$	13	9.6$_b$		
Having access to a toilet where you can feel Safe during menstruation	Always	48	18.1$_a$	42	31.1$_b$	20.068	0.000*
	Frequently	51	19.2$_a$	39	28.9$_b$		
	Rarely	111	41.9$_a$	31	23.0$_b$		
	Never	55	20.8$_a$	23	17.0$_a$		
Access to clean toilet paper during menstruation	Always	53	20.0$_a$	51	37.8$_b$	22.653	0.000*
	Frequently	53	20.0$_a$	31	23.0$_a$		
	Rarely	77	29.1$_a$	35	25.9$_a$		
	Never	82	30.9$_a$	18	13.3$_b$		
Feeling lack of privacy during menstruation	Always	51	19.2$_a$	17	12.6$_a$	26.969	0.000*
	Frequently	74	27.9$_a$	14	10.4$_b$		
	Rarely	68	25.7$_a$	39	28.9$_a$		
	Never	72	27.2$_a$	65	48.1$_b$		
Effects of lack of privacy on menstrual regularity	Always	42	15.8$_a$	10	7.4$_b$	54.618	0.000*
	Frequently	91	34.3$_a$	10	7.4$_b$		
	Rarely	71	26.8$_a$	45	33.3$_a$		
	Never	61	23.0$_a$	70	51.9$_b$		
Access to any health institution during menstruation	Always	48	18.1$_a$	43	31.9$_b$	15.512	0.000*
	Frequently	43	16.2$_a$	25	18.5$_a$		
	Rarely	104	39.2$_a$	35	25.9$_b$		
	Never	70	26.4$_a$	32	23.7$_a$		
Difficulty obtaining menstrual products	Always	83	31.3$_a$	15	11.1$_b$	25.117	0.000*
	Frequently	119	44.9$_a$	63	46.7$_a$		
	Rarely	63	23.8$_a$	57	42.2$_b$		

*:p<0.05 The letters a,b indicate the group from which the relationship originates. There is no relationship in relationships that contain the same letters

A binary logistic regression model was established to examine the effects of various variables on women's menstrual cycles and the materials and conditions required during the post-earthquake menstrual period. The model was statistically significant (p=0.000). Among the independent variables included in the model, only the lack of privacy during the menstrual period after the earthquake had a statistically significant effect on the impact of the menstrual cycle following the disaster (p=0.000). Accordingly, it was observed that a rare or non-existent lack of privacy during the menstrual period after the earthquake decreased the likelihood of experiencing an affected post-earthquake menstrual cycle, compared to those who always faced a lack of privacy: rarely – p=0.035, OR 0.339; never – p=0.005, OR 0.220, respectively) (Tab. 5).

DISCUSSION

The aim of the study is to examine whether the earthquake impacted women's menstrual patterns and contributed to menstrual poverty. While disasters affect all individuals, women from vulnerable groups often experience a disproportionate impact [13, 14]. The United Nations Population Fund (UNFPA) states that 3,910,497 women of reproductive age were impacted by the 2023 earthquake in Turkey [15].

The mean age of women who participated in the study was 27.27 ± 8.40 years, which is similar to the study by Kaplan et al. (27.72 ± 5.4) [16]. Socio-economic inequalities experienced by women in disasters, as well as inequalities connected with gender roles imposed on women by society, cause women to be more affected by disaster events [17]. Additionally, women who are faced with challenges, such as limited access to water, period products, sanitation, and

Table 5. Required materials and conditions during the post-earthquake menstrual period.

QUESTION	β	St.Error	P	Odds Ratio	Odds For 95 Confidence Interval	
					Bottom	Top
Difficulty accessing daily menstrual products after the earthquake						
No	-0.556	0.324	0.086	0.573	0.304	1.081
Access to clean water during menstruation (anytime)			0.592			
Frequently	-0.061	0.467	0.896	0.940	0.376	2.351
Rarely	-0.284	0.464	0.540	0.753	0.303	1.868
Never	-0.659	0.524	0.208	0.517	0.185	1.445
Access to soap during menstruation (anytime)			0.368			
Frequently	-0.823	0.488	0.092	0.439	0.169	1.143
Rarely	-0.375	0.527	0.476	0.687	0.244	1.931
Never	-0.204	0.648	0.752	0.815	0.229	2.901
Access to a toilet where one can feel safe during menstruation (anytime)			0.442			
Frequently	-0.119	0.443	0.788	0.888	0.372	2.115
Rarely	0.390	0.482	0.418	1.477	0.575	3.796
Never	-0.199	0.567	0.725	0.819	0.270	2.490
Access to clean toilet paper during menstruation after the earthquake (anytime)			0.896			
Frequently	0.285	0.478	0.551	1.330	0.521	3.395
Rarely	0.056	0.496	0.910	1.058	0.400	2.795
Never	0.227	0.635	0.721	1.255	0.361	4.356
Feeling a lack of privacy during menstruation after the earthquake (anytime)			0.827			
Frequently	0.484	0.522	0.353	1.623	0.584	4.515
Rarely	0.353	0.495	0.476	1.423	0.540	3.754
Never	0.294	0.509	0.563	1.342	0.495	3.637
Lack of privacy / space affecting menstrual patterns (always)			**0.000***			
Frequently	0.564	0.546	0.302	1.758	0.603	5.128
Rarely	-1.082	0.512	**0.035***	0.339	0.124	0.924
Never	-1.513	0.543	**0.005***	0.220	0.076	0.638
Access to any health institution (anytime)			0.363			
Frequently	0.305	0.428	0.477	1.356	0.586	3.137
Rarely	0.421	0.372	0.257	1.524	0.735	3.157
Never	0.603	0.342	0.078	1.828	0.935	3.572
Difficulty obtaining menstrual products (always)			0.607			
Frequently	-1,162	1.122	0.300	0.313	0.035	2.820
Rarely	-1,361	1.093	0.213	0.256	0.030	2.184
Never	-1,450	1.126	0.198	0.235	0.026	2.129
Model Statistics	Omnibus Chi-Square=83,135 **p=0.000*** Dependent Variable: "Affected status of the menstrual cycle after the earthquake" (1): Affected (0):Not affected					

* p<0.05

health centres during the menstruation period, cannot carry out menstrual hygiene management and are confronted with period poverty [11, 18]. In the current study, 66.7% of women between the ages of 18–29 and 71% of women between the ages of 30–53 who were affected by the earthquake, stated that they had difficulty in accessing menstrual products. In the recent earthquake in Haiti (2021), 90% of adolescent and young women had an unmet need for period products [19], and in Nepal in 2015, rescue and first aid were followed by menstrual hygiene needs among the basic needs of the two million surviving women. However, it is discerned that menstrual hygiene needs were generally neglected during disaster events [18].

Consistent with the findings of the current study, other studies on the 2023 earthquake in Turkey also report that women had difficulties accessing sanitary pads [20, 21], and that women living in their own homes had significantly better access to clean water, toilet paper, soap, and safe, private toilets than those in tents or containers. Previous research also highlights that women affected by disasters often could not access hygienic toilets, bathe, change underwear regularly, or find sanitary products [18, 22]. Many felt unsafe or lacked privacy when using toilets, particularly when they are far from living areas or had to be used alone [20]. Similar issues were observed after the 2021 earthquake in Haiti, where girls struggled to manage with menstruation due to lack of water,

soap, and safe toilets. Many families lacked private, roofed toilets. Women also expressed concerns about hygiene, family planning, and reproductive infections [19]. Among young, Venezuelan migrant women, 61% reported being unable to wash their hands when necessary, and 75.9% did not feel safe using available toilets [22]. Gender-separated toilets also exacerbated hygiene problems, as did the lack of all-gender toilets and bathrooms, which poseed numerous challenges for women, including the risk of sexual harassment. These issues were further exacerbated by the remote placement of toilets, their limited number, inadequate lighting [13].

The current study found that individuals living in the provinces had a lower rate of difficulty accessing daily menstrual products compared to those living in towns and villages, while another study reported that access to menstrual products was more difficult in rural areas [23]. In the current study, it was observed that the menstrual patterns of women were affected after the earthquake disaster. This finding supports the hypothesis of the study that menstrual patterns of women were affected by the earthquake. Özşahin determined that 51.9% of women had changes in their menstrual cycles after the earthquake in Turkey [21].

Another finding of the current study was that women whose menstrual cycles were affected after the earthquake had statistically significantly less access to daily menstrual products, clean water, toilet paper, soap, a toilet where they could feel safe during menstruation, and access to any health institution during the post-earthquake menstrual period than women whose menstrual cycles were not affected. In the study, the impact of disasters on women after the earthquake, only 0.8% of women felt that toilets and bathrooms were safe [24]. Women who are faced with such challenges as limited access to water, period products, sanitation, and health centres during the menstruation period, cannot carry out menstrual hygiene management, and are confronted with period poverty [11, 18]. Those whose menstrual patterns were affected experienced greater lack of privacy compared to those whose menstrual patterns were not affected, and this lack of privacy further contributed to disruptions in their menstrual cycles. In a qualitative study conducted among Syrian women living in migrant tents in Greece, it was reported that the women experienced difficulties in changing their menstrual supplies, and had privacy and safety concerns in the toilets [25].

In the binary logistic regression model of the current study, among the independent variables included, only the lack of privacy during the post-earthquake menstrual period had a statistically significant effect on the likelihood of experiencing an affected menstrual cycle after the earthquake ($p<0.05$). Conducted studies have shown that women who do not have a safe privacy space experience depression, anxiety and stress due to fear of stigmatization, fear and anxiety of contamination of menstrual fluid on clothing [7, 25]. Changes in the menstrual cycle are known to be influenced by various factors, including stress. In stressful situations, the release of gonadotropins and gonadal steroid hormones is inhibited, which subsequently leads to disruption of the typical menstrual cycle. Prolonged exposure to stress can lead to complete disruption of reproductive function [21]. Embarrassment, strongly tied to menstrual taboos – particularly concerns about bleeding through clothing or being seen carrying menstrual products to the toilet, highlights the importance of gender- or family-segregated toilets, and the need for adequate privacy to manage menstruation with dignity [7, 25].

Period poverty, which contributes to the development of reproductive and urinary tract infections, is a critical health issue that needs to be addressed. This is particularly due to the use of unhygienic materials and the lack of access to clean and suitable water and toilet facilities during menstruation. These factors significantly impact the quality of life of women and should be prioritized in public health discussions [8].

Given the above findings, it is clear that policymakers and service providers must prioritize the needs of women in the context of natural disasters. Addressing these specific needs is essential to ensure the health, safety, and overall well-being of women during such critical times.

Limitations of the study. First, data were collected only from literate respondents with Internet access. Due to disrupted communication infrastructure and ongoing emergency conditions, the sample may not represent all women in the affected area. Second, the study used an interview-based tool to assess menstrual cycle characteristics, which had not been validated for reliability or accuracy. Third, many potential participants declined to take part due to psychological distress, limiting the sample size and the generalizability of the results. Future research should include a more representative sample and use validated data collection instruments to improve the reliability and generalizability of findings.

CONCLUSIONS

The study determined that the majority of women affected by the earthquake had difficulty in accessing menstrual products, clean water, toilet paper, soap, a toilet where they could feel safe during menstruation, privacy, and any health institution during menstruation. Women living in containers and tents/other locations were found to have more access problems. Women experienced menstrual poverty along with lack of access to basic needs, a situation that affected the women's menstrual cycles.

In this context, considering that menstrual health and hygiene management are not only basic needs, but also a human right of all menstruating women, menstrual poverty is a worldwide issue that needs to be urgently resolved.

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