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A "Quiet" need in the disaster of the century: a qualitative study on menstrual hygiene management

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Abstract

Introduction On February 6, 2023, a devastating earthquake centered in Kahramanmaraş, Turkey, affected millions of people, forcing many to live in tent cities. Although menstrual hygiene is a basic need, it is often overlooked in disaster settings. This study aims to explore the problems and experiences related to menstrual hygiene management among women living in tent cities following the earthquake.

Methods This qualitative study was conducted in June 2023 with 12 women living in tent cities caused by the earthquake. Data were collected through semi-structured interviews conducted via Zoom. Each interview lasted approximately 30 min. The interviews were analyzed using content analysis, and themes and sub-themes reflecting the women's experiences were identified.

Results The content analysis revealed two main themes: "Challenges Related to Menstrual Hygiene" and "Additional Issues Related to the Menstrual Period." The first theme included difficulties accessing materials, problems with disposing of hygiene products, inadequate physical environments, and challenges related to religious rituals. The second theme highlighted changes in menstrual cycles, lack of access to comforting practices, and neglect of personal needs. The findings showed that menstrual hygiene management is an urgent yet often overlooked need during disaster periods.

Conclusion This study demonstrates that menstrual hygiene management is critical in disaster response efforts. Effective menstrual hygiene management is essential for protecting women's privacy and dignity. Healthcare professionals play a vital role in identifying these needs, ensuring the supply of hygiene materials, providing appropriate environments, and offering education to women. Integrating menstrual hygiene management into disaster response plans is crucial for improving women's health and well-being.

Key points

- *Menstrual Hygiene Management Neglected:* menstrual hygiene management needs are often overlooked during disaster relief, leading to significant health and dignity issues for women.
- *Significant Challenges:* Women in tent cities after the earthquake struggled to access sanitary products, maintain cleanliness, and find privacy, exacerbating their difficulties.

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• *Critical Role of Healthcare Professionals:* Healthcare professionals are essential in disaster response, helping to identify and address menstrual hygiene management needs and ensuring women's health and dignity are protected.

Keywords Women, Menstrual hygiene management, Kahramanmaraş earthquake

Introduction

On February 6, 2023, two significant earthquakes centered in Kahramanmaraş affected 11 provinces in southeast Turkey (Kahramanmaraş, Hatay, Adıyaman, Gaziantep, Malatya, Kilis, Diyarbakır, Adana, Osmaniye, Şanlıurfa, and Elazığ). It is reported that the number of people who died in these earthquakes was 50,096, and the number of people injured was 107,204 [1]. Additionally, the Disaster and Emergency Management Authority of Turkey (Afet ve Acil Durum Yönetimi Başkanlığı- AFAD) reported establishing 287 tent cities in the affected provinces, with 329,382 tents, including 48,500 in Adıyaman. While the tent cities addressed shelter needs, other essential needs remained unmet [1]. Despite prioritizing shelter, food, and clean water, women's menstrual hygiene management needs are often neglected in such disasters [2, 3]. Neglected menstrual hygiene management requirements lead to inadequate sanitation and unsafe living environments, referring to the lack of access to proper hygiene products, insufficient facilities for the disposal of menstrual waste, and overcrowded, unhygienic conditions in temporary shelters such as tent cities [4].

Menstrual hygiene management requires special care and attention for women. Menstrual hygiene management strategies vary from country to country and even within countries, depending on individual preferences, available resources, economic conditions, local traditions, cultural beliefs, and levels of knowledge [5]. In low-income settings, managing menstrual hygiene becomes more challenging. Women in these regions face difficulties accessing hygiene materials and safe toilet facilities, complicating the management of menstrual hygiene [6].

A study conducted after the Nepal earthquake found that menstrual hygiene management was considered the sixth most crucial need for women, with 18.8% of respondents describing it as an urgent need [3]. This highlights that menstrual hygiene management is a critical and urgent issue for women following disasters. However, it is often overlooked in disaster response efforts, indicating a gap in addressing women's hygiene needs during recovery.

To maintain proper menstrual hygiene management, access to hygiene products, a safe and private space for changing materials, and soap and water are essential [7]. Basic menstrual hygiene practices include cleaning

the genital area with water, using sanitary pads, and disposing of them safely [5, 8]. However, accessing these basic needs becomes increasingly difficult during disasters such as earthquakes. A multifaceted approach is also needed, including access to sufficient, safe toilets and water, proper disposal of used materials, and availability of hand-washing sinks [2]. Inadequate menstrual hygiene management can lead to various health issues, including genital and urinary tract infections. Poor hygiene conditions have been linked to reproductive tract infections. A systematic review has shown that poor menstrual hygiene management is associated with such infections [6].

Access to safe menstrual hygiene management supplies is often limited during disasters, which is a significant issue [9]. Menstrual hygiene management is frequently overlooked in post-disaster interventions and is considered a silent, unspoken need [3, 5]. In challenging conditions such as natural disasters, women's difficulty accessing hygiene products becomes even more pronounced. However, these challenges exist in regular times as well. Women, particularly those from low-income backgrounds, struggle to access essential hygiene products during their menstrual periods. Although data on this issue in Turkey is limited, the 18% Value-Added Tax (VAT) on menstrual products exacerbates access issues [10]. Understanding these challenges is crucial for planning humanitarian interventions [11]. Healthcare professionals, who play a key role in disaster management, take on many responsibilities, such as life-saving interventions, first aid, emergency response, triage, health education, and consultancy. In addition to these tasks, healthcare professionals' involvement in providing essential services, including protecting women's health and ensuring menstrual hygiene management, will significantly contribute to women's health during the earthquake.

Despite studies on menstrual hygiene management during earthquakes in Nepal and Iran, there is limited research on how earthquakes in Turkey affect menstrual hygiene management and the experiences of women regarding this issue [3, 12, 13]. This study aims to explore the problems and experiences of women living in tent cities after the earthquake in Turkey regarding menstrual hygiene management, which remains a silent need.

Materials and methods

Design

This study was conducted using descriptive phenomenology, a qualitative research method. Descriptive phenomenology focuses on in-depth descriptions of phenomena and aims to uncover participants' lived experiences [14]. Specifically, Colaizzi's descriptive phenomenological method was employed in this study to systematically analyze the participants' experiences and extract the essence of their lived realities. The main reason for selecting this design was to complete an in-depth exploration of the menstrual hygiene management problems and experiences of women affected by the earthquake. It allows for a clear and comprehensive depiction of complex, personal experiences. The lack of quantitative data or scales for menstrual hygiene management also emphasized the need for a qualitative approach. This study was reported according to the Consolidated Criteria for Qualitative Studies (COREQ) checklist [15].

Setting

The research was conducted in June 2023 in Adıyaman, one of the 11 provinces most severely affected by the February 6, 2023 earthquake in southeast Turkey, centered in Kahramanmaraş. Adıyaman was chosen as the study site due to the extreme damage it sustained, which made it one of the last areas to receive aid. The earthquake caused significant disruptions, rendering roads, airways, and railways unusable. As a result, hygiene-related problems became more critical due to assistance delayed, lack of access to clean water, and inadequate sanitation facilities.

Population and sample

The research population consisted of women staying in Adıyaman tent city in June 2023. The sample consisted of 12 earthquake-victim women who met the criteria for inclusion in the study through purposeful sampling on the specified date. In the literature, a qualitative study's sample size is 5–20 [14]. The sample size was determined depending on whether the data reached saturation. Since no new information on the subject could be identified in the last interview, it was decided that data saturation had been reached, and the data collection phase was terminated [16].

Research inclusion criteria

- Being 18 years or older
- Being an earthquake victim living in a tent city in Adıyaman
- Being in the menstrual period during the earthquake

- No communication problems
- Having internet access to collect online data.

Data collection tools

The research data was collected using the Sociodemographic Characteristics Form and Semi-Structured Interview Form.

Sociodemographic Characteristics Form: The sociodemographic characteristics form includes questions regarding age, educational level, employment status, menstrual cycle duration, menstrual period length, bathing habits during menstruation before the earthquake, and methods of disposing of pads before the earthquake.

Semi-Structured Interview Form: This form, developed in the light of the literature, consists of open-ended questions to determine the problems and experiences of women regarding menstrual hygiene management during and after the earthquake.

Data collection

This study conducted semi-structured, in-depth interviews to understand the experiences of women affected by the earthquake. These interviews are a key data collection method frequently used in qualitative research, allowing participants to express their experiences in detail [17]. The interviews were conducted using a semi-structured interview form designed to focus on the core questions of the study while offering flexibility for participants to share their thoughts freely. This form provided guidance based on the main themes of the research while also allowing for the detailed expression of the participants' experiences.

The interviews were conducted via Zoom, an online platform. The dates and times of the interviews were scheduled in advance based on the participants' availability, ensuring ease of access and maintaining their privacy. At the beginning of each interview, the purpose of the research was explained in detail, and the participants were informed that their involvement was voluntary. Verbal consent was obtained from each woman before starting the interview.

Each interview lasted approximately 30 min, and audio recordings were made via Zoom. Recording the interviews was to ensure that the data could be accurately transcribed and to prevent any loss of information. The researcher (Author 1) transcribed the audio recordings on the same day as the interviews. To ensure the accuracy and reliability of the interview data, the transcriptions faithfully reflected all the statements made during the interviews.

The statements given by the participants are included in the results section, quoted verbatim in quotation

marks, and italicized for emphasis. The numbers at each statement's end refer to the respective interview reference numbers. This method allowed participants to recount their experiences in their own words while enabling the researcher to analyze the data collected during the interviews systematically.

The semi-structured, in-depth interview method plays a significant role in collecting data on traumatic events, as it allows participants to share their experiences in a rich and detailed manner. Special care was taken to address the emotional sensitivities of the participants during the interviews. Considering that the women had experienced a traumatic event such as an earthquake, respect for their emotional state was maintained, and efforts were made to ensure that they felt safe while sharing their experiences. The researcher worked diligently to capture each participant's story as authentically and respectfully as possible. This process is critical to ensuring the trustworthiness and confirmability of the findings.

This approach enabled the collection of comprehensive and detailed data, offering a broader perspective on the women's experiences following the earthquake. The semi-structured interview form provided a flexible framework that allowed participants to express themselves freely while maintaining focus on the research questions. The data collected through this process contributed significantly to understanding the participants' experiences in the earthquake's aftermath.

Data analysis

Incorporating Colaizzi's descriptive phenomenological method

This study adopted Colaizzi's descriptive phenomenological method, widely recognized for its systematic approach to analyzing participants' lived experiences [14]. Colaizzi's process ensures that the essence of participants' experiences is accurately uncovered through rigorous and detailed analysis. The steps undertaken in this study are outlined below:

1. *Familiarization*: The recorded interviews were transcribed verbatim. After data was transcribed, the transcripts were evaluated by three independent researchers (Author 1, Author 2, Author 3). The researchers repeatedly read the transcripts to immerse themselves in the data and gain an overall understanding of participants' lived experiences.
2. *Extracting Significant Statements*: Meaningful and relevant statements related to the phenomenon under investigation were identified from each transcript. This process ensured that all critical perspectives were captured without omission.
3. *Formulating Meanings*: The significant statements were carefully analyzed to formulate meanings that reflect the participants' unique perspectives. This step involved bracketing the researcher's preconceptions to focus solely on the participants' narratives.
4. *Organizing Into Themes*: The formulated meanings were clustered into themes that represent the participants' shared experiences. Themes were derived inductively to ensure that they emerged naturally from the data.
5. *Developing a Comprehensive Description*: The themes were integrated into a comprehensive description of the phenomenon, providing a detailed and holistic view of the participants' experiences.
6. *Producing the Fundamental Structure*: The phenomenon's concise and essential structure was developed by synthesizing the comprehensive description into its fundamental elements.
7. *Validating With Participants*: To ensure credibility and accuracy, the findings were shared with a subset of participants for validation. Participants confirmed that the results authentically represented their experiences.

Rationale for Colaizzi's method

Colaizzi's method was chosen for its robustness and ability to capture the essence of participants' lived experiences in a structured manner. This approach is particularly suitable for exploring sensitive topics, such as menstrual hygiene management in disaster settings, where participants' voices must be authentically represented.

Ethical principles of research

Approval for the research was received from Atatürk University Faculty of Nursing Ethics Committee (Number: 2023–5/3). The purpose of the study and the data collection method was explained to the women affected by the earthquake. Verbal informed consent was obtained from those who volunteered to participate in the study. It was informed that the data would be used only for this research. Additionally, the women's names included in the study were not taken. Serial codes, such as K1, K2, etc., were created using participants' names to ensure anonymity and participant confidentiality in the report. Participants were given numbers, and all voice recordings and written documents were encrypted. The principles of the Declaration of Helsinki were observed throughout the research.

Consent to participate

Written informed consent was obtained from all participants prior to their inclusion in the study. The purpose of the research, procedures, and confidentiality measures were explained in detail to each participant, and their participation was entirely voluntary.

Results

The results related to the menstrual hygiene management problems and experiences among women living in tent cities following the earthquake are provided below.

Participants' demographics

The average age of the earthquake victims in the study was 31.33 ± 1.93 years. About 41.6% were high school graduates, 50% had a menstrual cycle of 28–30 days, and 50% menstruated for 4–5 days. Before the earthquake, 91.6% bathed during menstruation, and all had access to pads. Women disposed of pads by wrapping them in bags and throwing them in the trash (Table 1).

The data analysis obtained from the interviews with women affected by the earthquake resulted in 25 codes, seven sub-themes, and two themes (Table 2). The theme of "Difficulties with Menstrual Hygiene" was divided into four sub-themes: "Inadequate Menstrual Hygiene Products," "Product Replacement and Waste Management," "Inappropriate Physical Environment," and "Religious Rituals." Moreover, 12 codes were created. The second theme, "Additional Problems Related to the Menstrual Period," had three subthemes: Symptom Management, Inadequate Relief, and Neglect for Self-care. Thirteen codes were created (Table 2).

Themes

Two primary themes emerged from the analysis of the participants' experiences:

1. *Challenges Related to Menstrual Hygiene*: This theme encapsulates the difficulties women face in accessing menstrual hygiene products, managing waste, and coping with inadequate physical environments during their menstrual periods in the aftermath of the earthquake. These challenges often intersected with cultural and religious practices, highlighting the significant barriers women encountered while striving to maintain personal hygiene and dignity under extraordinary conditions.
2. *Additional Issues Related to the Menstrual Period*: This theme explores the broader impact of the earthquake on women's menstrual health and overall well-being. It includes physiological and emotional strug-

Table 1 Sociodemographic characteristics of women

Properties	Variables	n	%
Educational level	Primary education	3	25.0
	High school	5	41.6
	University	4	33.4
Working status	Yes	4	33.4
	No	8	66.6
Menstrual cycle duration	25–27	3	25.0
	28–30	6	50.0
	31 and over	3	25.0
Menstrual period	4–5 days	6	50.0
	6–7 days	4	33.4
	8- and over	2	16.6
Taking a bath while menstruating before the earthquake	Yes	11	91.6
	No	1	8.4
Method of destroying pads before earthquake	Wrap the pad in its own bag and do not throw it in the trash	12	100.0

Age $\bar{x}=31.33 \pm 1.93$

gles, such as changes in menstrual patterns, neglect of personal care, and the inability to access resources for managing pain and other symptoms effectively. The findings underline the compounded vulnerabilities experienced by women during disaster situations.

Sub-themes: inadequate menstrual hygiene products

Women affected by the earthquake stated that their biggest problem was accessing materials to be used during the menstrual period. All women (12) said they could not access sanitary pads for the first two days.

"We wrapped it in a cotton napkin and used it that way... I used it like that for two days." (K11)

"... Second hand clothes, I used them. We used whatever we found. (K1)

"I used old clothes. "I cut and used my children's clothes." (K2)

"We were able to find pads after two days. I was afraid that the pad would run out...."(K5)

"The first day, I put napkins in layers. ...I was able to find pads after the 2nd, 3rd day. ... do you think the one who uses socks, the one who uses napkins, or the one who uses leaves?" (K6).

"I couldn't find pads, but I used diapers." (K9)

"...we had nothing..., no pads. (K4)

Table 2 Themes, sub-themes, and codes obtained from the interviews

Themes	Sub-themes	Codes	n	
Difficulties with menstrual hygiene	Inadequate Menstrual Hygiene Products	Pad	12	
		Underwear	9	
		This	12	
		Napkin	5	
		Wet wipes	8	
	Product Replacement and Waste Management	Change	9	
		Destruction	7	
		Inappropriate Physical Environment	Bath	12
	Religious Rituals	Toilet	9	
		Feeling dirty	7	
		Ghusl ablution	8	
	Additional Problems Related To The Menstrual Period	Symptom Management	Privacy	3
			Hypermenorrhagia	3
Amenorrhagia			1	
Dysmenorrhagia			4	
Backache			5	
Inadequate Relief		Irritation	1	
		Painkiller	4	
		Hot water bag	4	
		Hot place	7	
		Rest	2	
Neglect		Sock	3	
		Blanket	2	
		Postponing the pain	5	
		Postponing physiological needs	3	

"I couldn't find the pad at first. "I made a tampon with a napkin." (K10)

Nine women stated they had problems accessing underwear, the most needed item during the menstrual cycle.

"There was no underwear. "I was able to change my underwear after five days." (K5)

"We couldn't even change our underwear because we didn't have any." (K7)

"I was able to change my underwear ten days after the earthquake." (K8)

"...we had nothing, we didn't even have underwear... (K4)

Once I could get into the house, I bought a spare pair of underwear. When staining occurred, when I wore one, I would immediately wash and dry the other. (K2)

Some women could not find water (12), napkins (5), and wet wipes (8) for menstrual hygiene.

"There was no water. I couldn't clean my private area. "I cleaned it with a wet wipe" (K10)

"We had water and electricity ten days after the earthquake." (K8)

"There were no wet wipes either. There was no water. "Even if there were wet wipes, it would have been better. Cleaning is not achieved with just napkins." (K5)

"I cleaned it with a napkin because there was no water."(K3)

"I only used napkins to clean up after using the toilet. There were no wet wipes either. "There was nothing else." (K5)

"... I couldn't clean my genital area. "I couldn't find any napkins, wet wipes, or anything." (K9)

Sub-themes: product replacement and waste management

Nine earthquake-affected women stated that they had problems changing the materials used, and 7 of them stated that they had problems destroying them.

"I couldn't find a place to change my pad. I was able to change it after a day. "I changed it in the car." (K9)

"I was on my period the day of the earthquake and had a pad on and never changed it that day. "I had a pad in my bag, but there was no place to change my pad." (K7)

"...I was changing in the mosque toilet." (K1)

"...We were staying with 4–5 families. ...I couldn't find a place to change my pad. I usually changed in the toilet, but it was dirty because there was no water. So sometimes I would change it in the room."(K12).

... There were 10–15 women in the house. It was as if we all had the same menstrual period. That's why I could change it to two a day at most. (K5)

"... We were 34–36 people. There was one sink. There was no environment for destruction. "We would put it inside our clothes and take a bag with us when we went to the toilet so that no one would see it." (K2).

"There were 20 of us staying in the woodshed in my mother's garden. We were afraid because it was dark, so we went to the toilet as a group of 3–5 people. ... We would immediately go in, change our pads, hide them, and come back..." (K8).

Sub-themes: inappropriate physical environment

All the women (12) stated they could not bathe for long.

"... water was limited, only drinking water. There was no bathroom. ... After arriving at the tent, we were wiping our entire bodies with wet wipes... My period ended in the tent, and I couldn't find a place to take a bath. Portable shower cabins came later. "I had to take a bath four days after my period ended." (K1).

"The bathroom was normally upstairs, but because we were afraid, we boiled water outside, and a week later, we took it downstairs in a basin." (K4)

"I took a bath ten days after the earthquake. However, I was able to take a proper shower after one month." (K12)

"I was able to take a bath after about 13 days." (K10)

"I was able to do it a week later when I went to Istanbul." (K7)

"I was able to take a bath after ten days. "I didn't bother to clean myself for minutes, just to get rid of the dirt and sweat on me." (K8)

"10 days later, we went to my brother's house in Manavgat, and I was able to take a bath there." (K6)

It was determined that nine women affected by the earthquake had problems finding a suitable toilet to relieve their excretion needs.

"We often went to the toilet in the garden, in the dark, in public, wherever we could find it. There were trees in the garden under them and a woodshed behind the house. We were going there. "It was awful." (K8).

"I couldn't go to the toilet. The surrounding area is open on all sides. Even if you go to the toilet, you do not mind cleaning your genitals at that moment. ... I didn't use a napkin because I didn't have one." (K6).

"We couldn't go to the toilet the day the earthquake happened. "I don't know if it's because of that fear." (K7)

Sub-themes: religious rituals

Some women felt dirty (7), were disturbed because they could not perform ablution (8), and stated that they had problems in terms of privacy (3).

"I said 'I'm disgusting' in the worst way you can think of during my period. The biggest difficulty was that I was dirty; I was disgusted with myself." (K1)

"I felt dirty because I could not perform ablution" (K5)

"I felt dirty, bad. "I could take a bath 3–4 days after my period ended, ten days after the earthquake." (K3)

"Not being able to perform ablution was the biggest difficulty" (K4)

"When I had my period, I would wear jackets on top of each other so that any stains would not be visible. Because I would be ashamed if it were seen" (K2)

Sub-themes: symptom management

In the study, there were also women experiencing problems such as hypermedia (3), amenorrhea (1), dysmenorrhea (4), lower back pain (5), and irritation (1).

"I was bleeding a lot..." (K1)

"My period was too much..." (K2)

"I was on my period the day of the earthquake. Is it because of fear? It was the 2nd day of my period, and the bleeding stopped. (K7)

"I normally wouldn't have cramps or pain during my period. I had aches and cramps due to fear and anxiety. (K10)

"It was awful because I had a lot of pain... I was in more pain because it was cold. (K6)

"I was in a lot of pain." (K12)

"...my back hurt too." (K4)

"It would have been better if I had not had my period during the earthquake, it was difficult for me." (K3)

"If I don't change my pad for a short time, my body gets irritated immediately; my body gets sensitive wounds; I couldn't walk for a while; it was irritated, and there was no cream. I applied sunflower oil. "The water was so cold, I couldn't hold my urine when I washed it with cold water." (K2).

Sub-themes: inadequate relief

In the study, women stated that they could not access comfortable practices such as painkillers (4), hot water bottles (4), warm environment (7), rest (2), socks (3), and blankets (2).

"I couldn't find a hot water bottle... You can go home warm and go to bed when you have pain. But it is so crowded after the earthquake that you cannot do anything. (K2)

"... It was cold." (K3)

"...I should have kept myself warm, but I couldn't. I couldn't find any socks or shoes... the weather was rainy and freezing. I needed painkillers and couldn't find them. Blankets arrived on days 5 and 6. "Yes, you are in a tent, but the tents were already wet; finding a blanket was a luxury for us at that time." (K6).

"... It's freezing cold... it's literally freezing outside." (K4)

"...I was in pain, I couldn't find anything to relieve my pain." (K11)

"I was in so much pain, I couldn't find a water bottle. I couldn't find any painkillers. ...I couldn't find a place or a blanket where I could lie down and rest." (K12)

Sub-themes: neglect

In the study, women ignored pain (5) and physiological needs (3).

"Previously, my groin and lower back would hurt during my period. "With that shock, I didn't understand what was happening; I couldn't feel anything." (K8)

"A piece of my life was lost because I lost my brother; I felt nothing. "I never understood how my period started and ended because of my pain." (K9)

"I never thought of myself. I was bleeding a lot, but I didn't even share it with my spouse; that wasn't my priority. My priority was my children. That's why I couldn't think of any pain. Maybe it was painful, but I didn't feel it." (K1).

"Normally, I have pains during my period, and they are severe. "I don't remember because we were dealing with funerals at that moment, and we had a lot of deceased relatives." (K2)

"We had given up on sleeping, eating and drinking. We ate not enough to be full but just enough to survive. "We were in a lot of pain" (K12)

"The difficult part was that we couldn't clean ourselves, we couldn't go to the toilet, we couldn't eat, we couldn't drink tea, there was no water. "It was a difficult, bad time." (K3).

Discussion

Women are one of the most vulnerable groups during earthquakes and may be affected differently than other groups. When studies on menstrual hygiene management were examined in the literature, it was determined that most were related to young girls reaching menarche [18]. On the other hand, there are also studies showing the difficulties experienced by women affected by the earthquake [3, 12, 13].

Although it is often neglected during the post-disaster relief phase, menstrual hygiene management is a priority for women [19, 20]. All women (12) stated they could not access sanitary pads in the first two days. The biggest problem for women in this process is access to sanitary pads. It is seen that they are trying to find a solution by using materials such as napkins, cotton, old clothes, diapers, socks, and leaves. This situation reveals the importance of menstrual hygiene management supplies as much as food supply in natural disasters. Tearne et al.'s studies in the Nepal earthquake and Asumah et al. also stated that sanitary pads or cotton cloths were insufficient [13, 18]. In addition, some studies emphasize that reusable cotton diapers are used [13, 21]. The fact that sanitary pads arrived at the earthquake site after two days is consistent with the literature showing that menstrual hygiene management is not often given priority in relief efforts [3, 12, 13]. In the research, it was determined that women also used socks and diapers instead of sanitary pads. In Budhathok et al.'s study, women had to make do with the old cotton sari fabric, which was helpful.

During the Nepal earthquake, women tried to find a solution by placing cotton between the fabrics [3]. On the other hand, women's use of leaves is a remarkable practice, and it shows how resilient women are in difficult times. The studies conducted by Jewitt and Ryley [22] and Mason et al. [23] determined that young girls used leaves or grass when they had their period unexpectedly while at school. In Averbach et al.'s study, in Lebanon, some women stated that they placed newspapers or tissues under their private parts to reduce the possibility of menstrual leakage, despite concerns that newspaper ink could cause cancer [24]. This research determined that one of the women tried to find a solution by making a tampon from a napkin. These homemade options are often uncomfortable, leak frequently, and cause distress [22], or infections. It is a health risk for women to use inappropriate materials instead of sanitary pads during an earthquake. It was determined that health, food, shelter, and security were seen as urgent basic needs in post-earthquake relief interventions, and menstrual hygiene management needs were not included in the list of critical needs because they were thought to be specific to women only. The underlying reasons for the lack of sanitary pads in the standard relief supplies provided to earthquake victims and survivors in the first month require further investigation among humanitarian workers, logisticians, and organizations.

It was determined that there was a big problem in accessing underwear, which is most needed during the menstrual cycle. The study by Yoosefi Lebni et al. found that women had insufficient access to underwear after the earthquake [25]. There were also women in the study

who could not find water, napkins, and wet wipes to clean the perineal area. Asumah et al.'s study observed that most girls consciously tended the genital area at least three times a day during their menstrual period [18]. However, in this current study, many women had to wait for days before they could properly clean themselves. A study conducted in Kenya determined that approximately 84% of participants cleaned the genital area during menstruation [26]. This research shows that women have a greater need to clean the genital area during earthquake disasters, but there is insufficient access to water and cleaning products. Ignoring the urgent needs of women affected by the earthquake for cleaning supplies may put their health at risk and make returning to everyday life difficult. Inadequate hygiene during menstruation causes many health problems, such as genital and urinary tract infections.

The research determined that women affected by the earthquake had to change their pads in places where they thought they would ensure their privacy, such as a tent, a mosque's toilet, a room in a house, a woodshed, or a car. Some women could only change their pads briefly because they needed help finding a suitable place. In Budhathoki et al.'s study, earthquake-affected women had difficulty finding a safe place for privacy, even for a few minutes, because people were everywhere [3]. Schmitt et al. stated that women had difficulty finding areas where they could safely and privately change menstrual materials, clean themselves, and dispose of menstrual waste [27]. It is a significant problem that women cannot change their pads for long. For this reason, developing more absorbent sanitary pads that can be explicitly used during crises such as disasters may make it easier to overcome such problems/challenges.

It is observed that women affected by earthquakes also experienced problems in terms of not having enough safe and private space to dispose of products used during the menstrual period. In this study, women explained that they disposed of used pads by putting them in bags. A study by Asumah et al. determined that women wrapped the pads in bags and threw them into the bush, in the trash can, dug a hole and covered it with soil, or threw them into the toilet [18]. Schmitt et al. concluded that women either buried used materials or threw them directly into toilets, as they had done before, and the toilets became clogged [27]. Other studies have also determined that many women secretly throw used materials into household garbage by putting them in dark plastic bags [27, 28]. In Lebanon, it was determined that refugee women living in informal settlements had to throw their pads in the kitchen garbage [24]. The findings of this study indicate that the place where women go to change pads is an open area, there is a lack of privacy for pad

changing, and there is no designated area for disposal. A study in India reported that women threw used pads in inappropriate places [29]. Safe disposal of sanitary pads is an essential issue for public health [30]. In this research, even in difficult situations such as earthquakes, women should not throw the pads in open areas or toilets; they should wrap them in bags and throw them in the trash. This may be due to women's perception of privacy and their high level of knowledge.

The research determined that women had problems accessing toilets and bathrooms due to the earthquake. Zayas et al. stated that proper sanitation facilities for women in shelter camps must be established [19]. After the 2015 earthquake in Nepal, it was emphasized that women experienced a more significant lack of privacy than men and had limited access to safe bathrooms and toilet facilities [13, 31]. Asumah et al. reported that women had difficulties managing menstrual hygiene because they shared toilets [18]. In the study of Yoosefi Lebni et al., it was determined that women's access to bathrooms and toilets was ignored after the earthquake, women could not take a shower for two months, and women were embarrassed to take a shower after the bathroom was built [25]. This study's results, similar to the literature, showed that women's hygiene needs were neglected during the earthquake and could endanger their health. When natural disasters occur in third-world societies, some vital needs are ignored due to the lack of a proper support structure. Similarly, Rahmani Bilandi et al.'s study [32] reported that women's health needs were neglected. Therefore, the findings of this study support effective intervention and recovery in disasters. It adds to the already strong evidence that there is a need to explicitly consider women's menstrual hygiene management needs in the planning phase for menstrual hygiene.

The study determined that women could not perform ablution at the end of the menstrual cycle for their religious rituals. Religious and cultural practices greatly influence hygiene practices. Extensive literature shows that culture and religion impact menstrual hygiene management [33, 34]. In the study by Mohammed et al., almost all participants reported bathing regularly during their menstrual periods [28]. Although there is no explicit reference for the frequency of bathing during the menstrual period, it is essential to have proper hygiene and wash the body every day. Sharma et al. revealed that 64.2% of its participants took more than one bath [35].

On the other hand, a study by Michael et al. in Quetta, Pakistan, revealed that 58.2% of women never bathed during their menstrual periods [36]. The same study determined that girls felt uncomfortable due to the foul smell caused by menstrual blood and took frequent baths to relax [18]. In this study, most women (11 women)

stated that before the earthquake, they took a bath during menstruation, but after the earthquake, they could not take a bath for a long time or even perform ablution. Ghusl is an obligatory ritual in Islamic culture in which the body is thoroughly washed after exposure to religious contaminants such as sexual intercourse, menstruation, and childbirth. Asumah et al.'s study also showed that women perform ablution after their menstrual period [18]. The research determined that women described themselves as dirty, disgusting, and unclean because they could not perform ablution. This situation may have made it difficult for women to maintain their religious and psychosocial duties.

Moreover, these results once again revealed that the earthquake disadvantaged women. It was determined that there were significant deficiencies in terms of privacy and menstrual hygiene management. In menstrual hygiene management, women need more private spaces that provide privacy. Therefore, guaranteeing women's privacy and dignity during post-earthquake interventions is a fundamental right and should be protected [3].

In the research, it was determined that there were changes and additional symptoms related to menstrual bleeding. If earthquake-affected women ignore changes related to menstrual bleeding, it may cause more significant problems. When the literature was examined, it was determined that studies were generally conducted on menstrual hygiene, but studies on additional issues still needed to be carried out. In addition to hygiene deficiencies, it is essential to investigate women's menstrual changes in terms of their effects on health. It also contributes to the management of supporting women with additional problems such as back pain and cramps. In the study, a woman stated that because she changed her pad late, her perineal area was irritated, and she could not walk or hold her urine. The same woman is thought to have this problem because she cuts and uses old clothes and does not change them frequently. In the study of Asumah et al., it was stated that sanitary pads caused wounds in some women and caused difficulty in walking [18]. The advantages and disadvantages of these absorbent materials vary from person to person, affecting the selection of these materials. Schmitt et al. explained that Omen in Myanmar used damp cloth diapers, causing discomfort and irritation in the perineal area [27]. Cloth diapers can often lead to urinary tract and reproductive system infections when washed without following the correct procedures, with insufficient and unsafe water and soap, and repeatedly used without drying in the sun [37]. Health training before, during, and after the earthquake should also include important information about using cloth diapers for menstrual hygiene.

Women participating in the study also expressed problems with the lack of relaxing practices during the menstrual cycle. Asumah et al. also found that the biggest problem was insufficient warm water and medications that would reduce muscle cramps [18]. Similarly, in the study conducted by Tearne et al. during the Nepal earthquake, women stated that they could not find medicine [13]. In line with these results, it is essential to include comforting materials such as hot water bottles, socks, blankets, and medicine in emergency aid packages sent to the earthquake area.

It was determined that women ignored the pain and physiological needs they experienced due to the earthquake. In Budhathoki et al.'s study, a woman stated that she had her period right after the earthquake but could not tell her mother or other friends because she felt everyone was stressed and overwhelmed due to the chaos [3]. This shows how destructive an effect earthquakes have. Some studies stated that because women and men were together during the earthquake, they postponed sleep, a physiological need [13, 31]. This study concluded that women had to defer their physiological needs, such as sleep, nutrition, and shelter.

Limitations

One limitation of this study was the online data collection method. This approach may have limited participation to individuals with internet access, potentially excluding those in more remote or underserved areas. Moreover, online data collection might have restricted deeper interactions and rapport that can be established in face-to-face interviews.

Another limitation was the fact that the study was conducted in a single center, excluding women from the other ten affected provinces. Additionally, engaging with women who had lost loved ones, were menstruating during the earthquake, or faced difficulties accessing clean water in tent cities posed significant hurdles, limiting participant numbers and complicating data collection. Gathering data on sensitive issues like menstrual hygiene management in a disaster zone was particularly challenging, and the absence of questions related to reproductive and sexual health also represents another limitation.

Future research could address these limitations by conducting larger and more diverse studies that include participants from various socio-economic and geographical backgrounds to provide a more comprehensive understanding of the phenomenon.

Conclusion and recommendations

This study revealed that menstrual hygiene management remains an overlooked need in disaster settings. The findings indicated that menstrual hygiene management

requirements were not included in urgent need lists, primarily due to the misconception that these needs only concern women. This oversight poses significant challenges in safeguarding the health and dignity of women. Therefore, it is strongly recommended that menstrual hygiene kits be included in earthquake kits and emergency aid packages.

Given that women face challenges accessing toilets and showers after disasters, it is crucial to install portable shower cabins and toilets promptly to ensure public health. These facilities are not only necessary for hygiene but also to protect women's privacy and dignity. Healthcare professionals should recognize that, in addition to life-saving interventions such as first aid, emergency response, and triage, addressing the specific needs of women is equally important. Healthcare providers must identify menstrual hygiene-related needs, set priorities, act as intermediaries in meeting these needs, and provide necessary health education in collaboration with disaster coordination teams. Ensuring the management of menstrual hygiene during disasters is vital to addressing these "silent needs" and upholding the dignity and well-being of women.

Implications for practice, education, research, and policy

This study has significant implications for healthcare practice, particularly in disaster response. Menstrual hygiene management should be considered a critical public health issue during emergencies. Healthcare professionals must ensure that menstrual hygiene management supplies are included in emergency aid packages and that portable toilets and showers are quickly established in disaster-stricken areas to provide women with the necessary privacy. These measures will address hygiene and preserve the dignity and well-being of affected women.

In terms of education, healthcare professionals must be trained in menstrual hygiene management as part of disaster response education. Training programs should include specific modules on understanding and addressing women's needs during emergencies. By integrating menstrual hygiene management into disaster preparedness plans, healthcare workers will be better equipped to provide comprehensive care to women in crises.

From a research perspective, further studies are needed to explore women's challenges in managing menstrual hygiene during disasters. Quantitative and qualitative research should focus on understanding these needs in more detail and developing practical solutions. This will improve disaster response policies and ensure that women's unique needs are addressed adequately.

On a policy level, menstrual hygiene kits should be mandated in disaster response plans, and policies should be implemented to ensure the swift installation

of portable toilet and shower facilities. There should be increased awareness of women's specific needs during disasters, which should be reflected in national and international disaster response strategies. All emergency response policies should prioritize protecting women's privacy and dignity.

By implementing these recommendations in health-care practice, education, research, and policy, healthcare professionals and disaster response teams will be better equipped to meet women's critical yet often overlooked needs. This study underscores the importance of recognizing menstrual hygiene management as vital to public health and dignity in disaster settings.

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Authors' contributions

All listed authors meet the authorship criteria and that all authors are in the agreement with the content of the manuscript. All authors contributed to the study conception and design. 1. Study design: B.Ç., M.Ş.Ö., A.A. 2. Data collection: M.Ş.Ö., A.A. 3. Data analysis: M.Ş.Ö., A.A. 4. Study supervision: B.Ç., A.A. 5. Manuscript writing: B.Ç., M.Ş.Ö. 6. Critical revisions for important intellectual content: B.Ç., M.Ş.Ö., A.A.

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Data availability

Datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study received 15.05.2023 dated and (Sayı:2023–5/3) The Ethics Committee of the Nursing Faculty of Atatürk University took numbered approval. Written informed consent was obtained from all participants prior to their inclusion in the study. The purpose of the research, procedures, and confidentiality measures were explained in detail to each participant, and their participation was entirely voluntary. The study adhered to the principles outlined in the Declaration of Helsinki.

Competing interests

The authors declare no competing interests.

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