Research Square

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Sexual Health Literacy and Sexual and Reproductive Health Knowledge Among Midwives and Nurses in Turkey: Implications for Disaster and Emergency Situations

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Research Article

Keywords: Sexual health literacy, Disability-inclusive health care, sexual and reproductive health, nurse, midwife, Minimum Initial Service Package (MISP)

Posted Date: June 29th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9730756/v1

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Additional Declarations: No competing interests reported.

Abstract

This study aimed to determine the sexual health literacy levels and sexual and reproductive health (SRH) knowledge of midwives and nurses working in a public hospital during disaster situations, and to examine the relationship between these variables. This descriptive cross-sectional study was conducted with 360 midwives and nurses working at xxxx City Hospital in Turkey. Data were collected using the Sociodemographic Information Form, the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations, and the Sexual Health Literacy Scale (SHL). The mean total SRH knowledge score during extraordinary situations was 94.57 ± 12.17, and 46.1% of participants had a low level of SRH knowledge. The mean sexual health literacy score was 53.70 ± 8.59, with 59.7% of participants demonstrating a moderate level of literacy. Nurses had significantly higher SRH knowledge scores, whereas midwives had higher sexual health literacy and sexual knowledge scores. Higher education level, working in intensive care units, and having knowledge of the Minimum Initial Service Package (MISP) and the Turkish Disaster Response Plan were significantly associated with higher SRH knowledge. Strong and positive correlations were found between sexual health literacy and SRH knowledge levels. The findings indicate that the effectiveness of sexual and reproductive health services in disaster and emergency situations depends not only on healthcare professionals' knowledge but also on the multidimensional nature of sexual health literacy. These results highlight the need for comprehensive, inclusive, and rights-based training programs to strengthen SRH services for vulnerable groups, including persons with disabilities, during disasters.

Highlights

• Nearly half of healthcare professionals had low SRH knowledge in disasters.

• Sexual health literacy showed strong positive correlations with SRH knowledge.

• Nurses and midwives differed significantly in SRH knowledge and literacy domains.

• Higher education and disaster preparedness increased SRH knowledge levels.

• Findings highlight the need for inclusive SRH training in disaster settings.

Introduction

Disasters and other extraordinary situations seriously disrupt the functioning of health systems and significantly limit individuals' access to essential health services. One of the most affected areas in such contexts is sexual and reproductive health (SRH) services. During disasters, damage to health infrastructure, interruptions in service delivery, and shortages in human resources hinder access to SRH services and restrict access to accurate and timely information in this field (1). International organizations such as the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the United Nations Office for Disaster Risk Reduction (UNDRR) emphasize that ensuring sustainable access to health services during disasters is a fundamental human right (2–4). Accordingly, the Sendai Framework for Disaster Risk Reduction explicitly states that protecting health in emergencies is not only a medical necessity but also a social, economic, and political responsibility.

Disasters are defined as natural or human-induced events that cause physical, economic, and social losses for entire societies or specific population groups and severely disrupt normal life and human activities (5). Globally, both the frequency and severity of disasters have been increasing; in 2023 alone, 399 natural disasters were recorded worldwide, affecting approximately 93 million people (6). Disasters have become a major public health concern, as they directly threaten fundamental human rights such as life, health, safety, and access to adequate nutrition, while simultaneously deepening existing social inequalities (7–9). Although disasters affect all segments of society, women, persons with disabilities, children, older adults, and socioeconomically disadvantaged groups are disproportionately impacted. Studies conducted by Oxfam International indicate that women and individuals with disabilities face higher risks and encounter multiple barriers to accessing health services during emergencies (10, 11). The tendency to assign low priority to SRH services during disasters further exacerbates these existing inequalities (12). In Türkiye, following the earthquakes of February 6, 2023, 52.8% of hospitalized patients were women, clearly highlighting the critical importance of women's health in disaster contexts (13). Restricted access to SRH services during disasters can result in serious consequences, including inadequate family planning, disrupted antenatal and postnatal care, and increased maternal and neonatal morbidity and mortality (1, 10, 14). The literature reports that disasters such as tsunamis, floods, earthquakes, and hurricanes increase the risk of pregnancy-related complications, including preterm birth, stillbirth, spontaneous abortion, and premature rupture of membranes (15). Furthermore, disasters are associated with increased rates of sexual violence, unintended pregnancies, unsafe abortions, sexually transmitted infections (STIs), and HIV (12, 15). In this context, the planning, coordination, implementation, and evaluation of SRH services during disasters are of critical importance. The United Nations Population Fund (UNFPA) and the United Nations High Commissioner for Refugees (UNHCR) developed the Minimum Initial Service Package (MISP) for Reproductive Health in Crisis Situations to establish minimum standards for SRH services in emergencies (16, 17). The MISP includes essential interventions aimed at preventing and managing sexual violence, reducing HIV transmission, preventing maternal and neonatal deaths, and planning comprehensive reproductive health services. In addition, the Sustainable Development Goals (SDGs) emphasize universal access to SRH services and the promotion of rights-based approaches (18). Effective utilization of SRH services depends not only on the capacity of health systems but also on the health literacy levels of individuals and healthcare professionals, particularly sexual health literacy (14, 19). Sexual health literacy refers to individuals' ability to access, understand, evaluate, and apply information related to sexual health in order to make appropriate health decisions (20). This competence directly influences the development of healthy sexual behaviors, prevention of STIs, effective family planning, protection of sexual health rights, and prevention of sexual violence (21). During disaster situations, both access to SRH services and levels of sexual health literacy may decline significantly. It has been reported that approximately 40% of women affected by disasters experience difficulties in accessing sexual health services (8). This suggests that reduced sexual health literacy in disaster contexts may further limit the utilization of available health services. Therefore, strengthening SRH services in disaster settings necessitates improving healthcare professionals' knowledge and sexual health literacy levels. Midwives and nurses play a pivotal role in the provision of women's health and SRH

services at both primary and hospital care levels. The International Council of Nurses (ICN) emphasizes that all nurses should possess the necessary knowledge and skills for disaster preparedness, response, and care (22). However, the literature indicates a scarcity of quantitative studies that simultaneously examine sexual health literacy and SRH knowledge among midwives and nurses in disaster contexts.

Moreover, most existing studies focus primarily on structural deficiencies in SRH services during disasters, disruptions in service delivery, or health outcomes experienced by women, while healthcare professionals' knowledge levels and individual competencies are often treated as secondary considerations. In particular, the relationship between sexual health literacy and SRH knowledge in disaster settings has not been sufficiently explored. Sexual health literacy encompasses not only knowledge acquisition but also the ability to critically evaluate information, apply it appropriately, and make informed health decisions in complex contexts. The limited number of studies addressing this relationship represents a significant knowledge gap in efforts to develop inclusive and rights-based SRH services for vulnerable populations during disasters. Accordingly, this study was designed to determine the sexual health literacy levels and sexual and reproductive health knowledge of midwives and nurses working in a public hospital, and to examine the relationship between these variables in the context of disaster and emergency situations. The findings are expected to contribute to the development of inclusive, rights-based SRH services for vulnerable groups in disaster settings.

Research Questions

1. What is the level of sexual health literacy among midwives and nurses working in a public hospital?
2. What is the level of sexual and reproductive health knowledge of midwives and nurses in disaster and emergency situations?
3. Is there a relationship between the sociodemographic characteristics of midwives and nurses and their sexual health literacy levels?
4. Is there a relationship between the sociodemographic characteristics of midwives and nurses and their sexual and reproductive health knowledge in disaster situations?
5. Is there a relationship between sexual health literacy levels and sexual and reproductive health knowledge in disaster and emergency situations among midwives and nurses?

Materials and Methods

Study Design and Setting

This study employed a descriptive cross-sectional design and was conducted between January and June 2024 among midwives and nurses working in the clinical units of xxxxx Hospital in Türkiye.

Population and Sample

The study population consisted of 1,200 midwives and nurses employed at xxxxxx Hospital. The required sample size was calculated using G*Power version 3.1.7 based on an independent samples *t*-test. Assuming a known mean score of 19.06 with a standard deviation of 3.68, an effect size (Cohen's *d*) of 0.27 was estimated to detect a one-point difference with 95% power (1–β = 0.95) at a 5% significance level (α = 0.05). Accordingly, the minimum required sample size was determined to be 292 participants (20). To account for potential data loss, the study was completed with a total of 360 participants. Participants were selected from among midwives and nurses working at the hospital using a non-probability sampling method.

Data Collection Instruments

Data were collected using a Sociodemographic Information Form, the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations, and the Sexual Health Literacy Scale (SHLS).

Sociodemographic Information Form

The Sociodemographic Information Form was developed by the researchers based on a review of the literature and included questions related to the sociodemographic characteristics of midwives and nurses, as well as their knowledge, attitudes, and behaviors regarding sexual and reproductive health.

Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations

The Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations, developed by Ekrem and Kurt (2023), aims to assess the level of knowledge among midwives and nurses regarding sexual and reproductive health in extraordinary situations such as disasters. The scale consists of 23 items rated on a five-point Likert scale and includes four subdimensions: (1) Empowerment of Women's Health, (2) Supply of Materials for Implementing the Minimum Initial Service Package in Extraordinary Situations, (3) Basic Knowledge of the Minimum Initial Service Package in Extraordinary Situations, and (4) Strategy and Training for the Minimum Initial Service Package in Extraordinary Situations. Higher total and subscale scores indicate higher levels of knowledge. In the present study, the internal consistency coefficient (Cronbach's alpha) of the scale was calculated as 0.94 (23).

Sexual Health Literacy Scale (SHLS)

The Sexual Health Literacy Scale (SHLS), developed by Üstgörül (2022), was designed to assess the level of sexual health literacy among midwives and nurses. The scale consists of 17 items rated on a five-point Likert scale and includes two subdimensions: Sexual Knowledge and Sexual Attitudes. Higher scores on the total scale and subscales indicate higher levels of sexual health literacy. In the present study, the internal consistency coefficient (Cronbach's alpha) was calculated as 0.84 (20).

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp., 2017). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. The normality of continuous variables was assessed using the Shapiro–Wilk test and by examining skewness and kurtosis values within the range of − 1.5 to + 1.5. As the assumption of normality was met, independent samples *t*-tests were used to compare the means of two groups, and one-way analysis of variance (ANOVA) with Bonferroni post hoc tests was used for comparisons involving three or more groups. In cases where group sizes were small or the normality assumption was violated, the non-parametric Kruskal–Wallis *H* test was applied. Categorical variables were compared using the chi-square test. Relationships between continuous variables were examined using correlation analysis, and variables found to be significant in univariate analyses were further examined using linear regression analysis. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval

for the study was obtained from the xxxx Non-Interventional Ethics Committee (xxxxxx). Institutional permission was granted by the xxxx Provincial Directorate of Health (date: xxxx;xxxxx). The study was conducted in accordance with the principles of the Declaration of Helsinki. The purpose of the study was explained to all participants, and data were collected after obtaining informed consent.

Results

Of the participants, 73.6% were nurses and 26.4% were midwives. Among the nurses, 53.6% were aged between 22 and 35 years, 61.9% were married, 66.8% held a bachelor's degree, 52.4% had 10 years or more of professional experience, and 46.7% were working in intensive care units. Among the midwives, 48.5% were aged between 36 and 45 years, 53.7% were single, 50.7% held a bachelor's degree, 67.4% had 10 years or more of professional experience, and 29.6% were working in internal medicine clinics. During their formal education, 76.9% of nurses and 66.3% of midwives reported having received information on sexual and reproductive health (SRH). In addition, 75.8% of nurses and 82.1% of midwives expressed a desire for SRH-related topics to be included in institutional in-service training programs. When sources of SRH information were examined, nurses most frequently reported obtaining information from the internet or television (52.5%), physicians (52.1%), and other nurses or midwives (61.5%). Nurses commonly defined SRH as protection against sexually transmitted infections (76.9%) and healthy sexuality (74.3%). A large proportion of both nurses (87.1%) and midwives (82.1%) emphasized the importance of SRH services during disaster situations. However, 56.2% of nurses and 55.7% of midwives reported perceiving a specific need for SRH services during disasters. The most frequently identified SRH-related problems encountered during disasters by nurses were sexual violence (76.2%), genital tract infections (76.6%), and HIV infection (74.0%). Similarly, midwives identified sexual violence (76.8%), genital tract infections (76.8%), and HIV infection (74.7%) as the most common SRH-related issues in disaster settings. Regarding disaster preparedness frameworks, only 12.8% of nurses and 21.0% of midwives reported having knowledge of the Minimum Initial Service Package (MISP). In addition, 20.3% of nurses and 25.2% of midwives indicated that they were familiar with the Turkish Disaster Response Plan (TDRP).

The mean total score of the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations was 94.57 ± 12.17. The mean scores of the subdimensions were 52.44 ± 6.92 for Empowerment of Women's Health, 18.99 ± 3.62 for Supply of Materials for Implementing the Minimum Initial Service Package in Extraordinary Situations, 11.93 ± 2.29 for Basic Knowledge of the Minimum Initial Service Package in Extraordinary Situations, and 11.20 ± 2.07 for Strategy and Training for the Minimum Initial Service Package in Extraordinary Situations. The mean total score of the Sexual Health Literacy Scale was 53.70 ± 8.59, with mean subscale scores of 40.43 ± 7.64 for Sexual Knowledge and 13.27 ± 3.82 for Sexual Attitudes (Table 1). Overall, 46.1% of participants were classified as having a low level of sexual and reproductive health knowledge in extraordinary situations, whereas 59.7% demonstrated a moderate level of sexual health literacy.

Table 1
Mean Scores of the Scale and Its Subdimensions

	Min	Max	Mean	S.D	Skewness	Kurtosis	Kolmogorov-Smirnov		
							Test value	sd	p
Empowerment of Women's Health	38.6	66.28	52.44	6.92	-0.91	0.3	0.14	360	**0.00**
Supply of Materials for Implementing the Minimum Initial Service Package in Extraordinary Situations	11.75	26.23	18.99	3.62	0.17	-0.6	0.14	360	**0.00**
Basic Knowledge of the Minimum Initial Service Package in Extraordinary Situations	7.35	16.51	11.93	2.29	-0.36	-0.34	0.14	360	**0.00**
Strategy and Training for the Minimum Initial Service Package in Extraordinary Situations	7.06	15.34	11.2	2.07	0.17	-0.39	0.14	360	**0.00**
Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations -Total	70.23	118.91	94.57	12.17	-0.42	-0.32	0.06	360	**0.01**
Sexual Knowledge	25.15	55.71	40.43	7.64	-0.09	0.3	0.08	360	**0.00**
Sexual Attitudes	5.63	20.91	13.27	3.82	0.73	0.76	0.14	360	**0.00**
Sexual Health Literacy Scale-Total	36.52	70.88	53.7	8.59	0.4	1	0.12	360	**0.00**

Nurses had significantly higher mean total scores on the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations (95.44 ± 10.92) and on the Empowerment of Women's Health subdimension (53.16 ± 6.20) compared with midwives. In contrast, midwives demonstrated significantly higher mean total scores on the Sexual Health Literacy Scale (55.71 ± 8.46) and on the Sexual Knowledge subdimension (42.25 ± 7.69) than nurses. Participants with postgraduate education (99.44 ± 11.73), those working in intensive care units (98.25 ± 9.66), those who expressed a desire for in-service training on sexual and reproductive health (95.23 ± 12.07), those who perceived a need for sexual and reproductive health services during disasters (97.55 ± 10.87), those who reported having knowledge of the Minimum Initial Service Package for Reproductive Health in Crises (MISP) (96.65 ± 10.87), and those who were familiar with the Turkish Disaster Response Plan (TDRP) (99.76 ± 9.85) had significantly higher mean total scores on the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations compared with other groups ($p < 0.05$). Similarly, significantly higher mean scores on the Empowerment of Women's Health subdimension were observed among participants with postgraduate education (54.98 ± 6.15), those working in intensive care units (54.56 ± 5.68), those who perceived a need for sexual and reproductive health services during disasters (54.11 ± 5.93), those with knowledge of MISP (53.55 ± 6.17), and those who were familiar with TDRP (54.29 ± 5.34) ($p < 0.05$). Higher mean scores on the Supply of Materials for Implementing the Minimum Initial Service Package subdimension were found among participants with postgraduate education (20.51 ± 3.74), those requesting in-service sexual and reproductive health training (19.20 ± 3.59), those with knowledge of MISP (19.39 ± 3.46), and those familiar with TDRP (20.64 ± 3.36) ($p < 0.05$). Likewise, significantly higher mean scores on the Basic Knowledge of the Minimum Initial Service Package subdimension were observed among participants with postgraduate education (12.53 ± 2.33), those working in intensive care units (12.42 ± 2.05), those who perceived a need for sexual and reproductive health services during disasters (12.53 ± 2.20), those with knowledge of MISP (12.27 ± 2.13), and those familiar with TDRP (12.82 ± 1.88) ($p < 0.05$). With regard to sexual health literacy, a significant difference in total Sexual Health Literacy Scale scores was observed only among participants with postgraduate education (57.26 ± 9.05). For the Sexual Knowledge subdimension, participants with postgraduate education (44.35 ± 7.26) and those requesting in-service sexual and reproductive health training (40.91 ± 7.85) demonstrated significantly higher scores ($p < 0.05$). Finally, significantly higher mean scores on the Sexual Attitudes subdimension were observed among participants requesting in-service sexual and reproductive health training (14.21 ± 3.27) and among those who reported no knowledge of the Turkish Disaster Response Plan (13.68 ± 3.77) ($p < 0.05$) (Table 2).

Table 2
Comparison of Selected Variables with the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations and Its Subdimensions (n = 360)

Variables	Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations - Total		Empowerment of Women's Health		Supply of Materials for Implementing the Minimum Initial Service Package in Extraordinary Situations		Basic Knowledge of the Minimum Initial Service Package in Extraordinary Situations		Strategy and Training for the Minimum Initial Service Package in Extraordinary Situations		Sexual Health Literacy Scale-Total		Sexual Knowledge		Sexual Attitudes	
	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.
Professional group																
Midwife	92.14	14.92	50.44	8.34	18.97	3.97	11.74	2.56	**10.99**	**2.27**	55.71	8.46	42.25	7.69	13.45	3.92
Nurse	95.44	10.92	53.16	6.20	19.00	3.49	**12.00**	**2.19**	**11.28**	**1.99**	52.98	8.54	39.78	7.53	13.21	3.79
t	**-2.28**		**-3.33**		-0.08		-0.95		-1.17		**2.67**		**2.73**		0.54	
p	**0.02***		**0.00***		0.94		0.34		0.24		**0.01***		**0.01***		0.59	
Educational level																
Health Vocational High School	87.00	12.40	48.24	6.71	17.53	3.43	11.00	2.40	10.24	2.03	54.06	7.41	40.35	6.36	13.71	3.75
Associate Degree	94.26	12.95	52.40	7.17	18.83	4.26	11.98	2.35	11.05	2.25	56.31	9.30	42.50	8.23	13.81	4.59
Bachelor's Degree	94.86	11.53	52.60	6.79	18.97	3.35	11.94	2.22	11.35	1.98	52.30	8.16	39.16	7.41	13.14	3.45
Postgraduate Degree	99.44	11.73	54.98	6.15	20.51	3.74	12.53	2.33	11.42	2.13	57.26	9.05	44.35	7.26	12.91	4.60
t	**7.08**		**6.42**		**4.55**		**2.92**		**3.17**		**2.67**		**2.73**		**0**.54	
p	**0.00***		**0.00***		**0.00***		**0.03***		**0.02***		**0.01***		**0.01***		0.59	
Working clinical unit																
Emergency Department	89.59	13.01	49.03	6.92	18.57	3.90	11.31	2.35	10.67	2.11	53.76	9.98	41.12	9.15	12.64	3.78
Intensive Care Unit	98.25	9.66	54.56	5.68	19.44	3.57	12.42	2.05	11.83	1.84	53.78	9.00	40.34	7.81	13.44	4.10
Internal Medicine Clinics	92.06	12.87	51.20	7.16	18.70	3.38	11.61	2.51	10.54	2.06	53.94	8.22	40.85	6.99	13.09	3.34
Surgical Clinics	94.73	12.98	52.68	7.45	18.79	3.59	12.08	2.42	11.18	2.29	53.45	8.21	40.05	7.12	13.40	3.85
Outpatient Clinics	92.63	2.90	51.56	7.36	18.81	3.72	11.42	2.20	10.83	1.91	53.46	6.56	39.88	6.70	13.78	3.58
F	**6.89**		**7.95**		0.89		**3.68**		**6.23**		0.04		0.26		0.59	
p	**0.00***		**0.00***		0.47		**0.01***		**0.00***		1.00		0.90		0.67	
Request for in-service SRH training																
Yes	95.23	12.07	52.79	6.75	19.20	3.59	12.03	2.32	11.22	2.07	53.91	9.01	40.91	7.85	13.00	3.93
No	92.27	12.29	51.23	7.43	18.28	3.65	11.59	2.16	11.16	2.07	53.00	6.97	38.79	6.68	14.21	3.27
t	**1.94**		1.79		**2.02**		1.50		0.21		0.84		**2.21**		**-2.53**	
p	**0.05***		0.07*		**0.04***		0.13*		0.83		0.40		**0.03***		**0.01***	
Perceived need for SRH services during disasters																
Yes	97.55	10.87	54.11	5.93	19.47	3.81	12.53	2.20	11.44	1.95	54.19	8.90	41.24	7.75	12.95	4.00
No	92.58	12.10	51.67	7.16	18.38	3.29	11.41	2.07	11.13	2.06	53.12	8.11	39.13	6.77	13.99	3.65
No knowledge	89.34	13.04	49.26	7.64	18.39	3.26	10.97	2.26	10.72	2.25	53.06	8.26	39.60	7.88	13.46	3.48
F	**16.52**		**17.10**		4.05		**18.19**		**3.88**		0.73		2.69		2.06	

*p < 0.05, t: Independent samples t-test; F: One-way analysis of variance (ANOVA)

Variables	Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations - Total		Empowerment of Women's Health		Supply of Materials for Implementing the Minimum Initial Service Package in Extraordinary Situations		Basic Knowledge of the Minimum Initial Service Package in Extraordinary Situations		Strategy and Training for the Minimum Initial Service Package in Extraordinary Situations		Sexual Health Literacy Scale-Total		Sexual Knowledge		Sexual Attitudes	
	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.	X̄	S.D.
Professional group																
p	**0.00***		**0.00***		0.06		**0.00***		**0.02***		0.48		0.07		0.13	
Knowledge of the MISP																
Yes	96.65	10.87	53.55	6.17	19.39	3.46	12.27	2.13	11.45	1.89	53.40	8.75	40.28	7.65	13.12	3.89
No	76.90	9.40	42.50	7.18	15.00	3.20	9.80	1.62	9.60	2.27	56.30	5.50	43.90	7.14	12.40	2.91
No knowledge	83.20	12.47	46.54	7.44	17.02	3.74	9.90	2.31	9.73	2.49	55.37	7.82	40.76	7.66	14.61	3.29
F	**28.5**		**30.34**		**6.93**		**36.49**		**8.17**		0.73		2.69		2.06	
p	**0.00***		**0.00***		**0.02***		**0.00***		**0.00***		0.48		0.07		0.13	
Knowledge of the Turkish Disaster Response Plan (TDRP)																
Yes	99.76	9.85	54.29	5.34	20.64	3.36	12.82	1.88	12.00	1.97	55.00	11.43	41.87	9.64	13.13	4.66
No	93.82	11.80	52.50	6.91	18.44	3.55	11.81	2.35	11.07	2.04	53.37	6.67	40.24	6.43	13.13	3.46
No knowledge	91.74	13.40	50.79	7.74	18.73	3.60	11.41	2.30	10.81	2.05	53.30	9.24	39.62	7.94	13.68	3.77
F	**10.50**		**5.62**		**11.11**		**8.88**		**8.23**		1.36		5.63		**6.86**	
p	**0.00***		**0.00***		**0.00***		**0.00***		**0.00***		0.50		0.06		**0.04***	

*p < 0.05, t: Independent samples t-test; F: One-way analysis of variance (ANOVA)

As presented in Table 3, the relationships between sexual health literacy and sexual and reproductive health knowledge in extraordinary situations were examined using Pearson correlation analysis. The findings indicate statistically significant associations between the variables at varying levels of strength. A strong and positive correlation was identified between the Empowerment of Women's Health subdimension and the total score of the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations ($r = 0.898$, $p < 0.001$), indicating that higher levels of knowledge related to women's health empowerment were associated with higher overall SRH knowledge in extraordinary situations. Similarly, a strong positive correlation was observed between the Supply of Materials for Implementing the Minimum Initial Service Package subdimension and the total SRH knowledge score ($r = 0.764$, $p < 0.001$). The Basic Knowledge of the Minimum Initial Service Package ($r = 0.782$, $p < 0.001$) and the Strategy and Training subdimension ($r = 0.675$, $p < 0.001$) also demonstrated significant and positive correlations with the total SRH knowledge score. With respect to sexual health literacy, a very strong positive correlation was found between the total score of the Sexual Health Literacy Scale and the Sexual Knowledge subdimension ($r = 0.895$, $p < 0.001$). In addition, a moderate positive correlation was identified between the Sexual Attitudes subdimension and the total sexual health literacy score ($r = 0.456$, $p < 0.001$). These findings support the notion that both sexual knowledge and sexual attitudes constitute core components of sexual health literacy. In contrast, a significant negative correlation was observed between the Sexual Attitudes subdimension and the Empowerment of Women's Health subdimension ($r = -0.737$, $p < 0.01$), suggesting that attitudinal dimensions may not always progress in parallel with knowledge-based variables. Overall, the results demonstrate significant and predominantly positive associations between sexual health literacy and sexual and reproductive health knowledge in extraordinary situations. These findings highlight the critical role of sexual health literacy in understanding and effectively delivering sexual and reproductive health services during emergencies, particularly for vulnerable populations.

Table 3
Relationship between sexual health literacy knowledge level and sexual and reproductive health knowledge in extraordinary situations according to Pearson correlation analysis

		1	2	3	4	5	6	7	8
Empowerment of Women's Health Subdimension (1)	**r**	**1**	**0.483****	**0.584****	**0.445****	**0.898****	**0.096**	**-0.737****	**0.025**
	p		**0.000**	**0.000**	**0.000**	**0.000**	**0.068**	**0.009**	**0.639**
Supply of Materials for Implementing the Minimum Initial Service Package in Extraordinary Situations (2)	r		1	0.567**	0.501**	0.764**	0.697**	-0.028	0.563**
	p			0.000	0.000	0.000	0.000	0.598	0.002
Basic Knowledge of the Minimum Initial Service Package in Extraordinary Situations (3)	r			1	0.548**	0.782**	0.743**	-0.077	0.093
	p				0.000	0.000	0.007	0.147	0.077
Strategy and Training for the Minimum Initial Service Package in Extraordinary Situations (4)	r				1	0.675**	0.019	-0.008	0.013
	p					0.000	0.722	0.874	0.806
Total Score of the Sexual and Reproductive Health Knowledge Scale in Extraordinary Situations (5)	r					1	0.544**	-0.102	0.082
	p						0.006	0.053	0.119
Sexual Knowledge (6)	r						1	0.013	0.895**
	p							0.809	0.000
Sexual Attitudes (7)	r							1	0.456**
	p								0
Total Score of the Sexual Health Literacy Scale (8)	r								1
	p								
r: Pearson korelasyon katsayısı									

Discussion

In this study, although the mean total score of the Sexual and Reproductive Health (SRH) Knowledge Scale in Extraordinary Situations indicated a moderate level of knowledge, it is noteworthy that nearly half of the participants (46.1%) were classified as having a low level of SRH knowledge. In contrast, the predominance of a moderate level of sexual health literacy among participants (59.7%) highlights the structural distinction between the concepts of knowledge and literacy. The literature emphasizes that sexual health literacy extends beyond the mere possession of information and represents a multidimensional competency that encompasses the ability to evaluate information, apply it appropriately within a given context, and translate it into clinical practice (24, 25).

The higher mean score observed for the Empowerment of Women's Health subdimension compared with other Minimum Initial Service Package (MISP) components within the Sexual and Reproductive Health (SRH) Knowledge Scale suggests that participants had relatively greater awareness of women's health issues in disaster and extraordinary situations. The literature indicates that women with disabilities experience multiple layers of vulnerability in accessing sexual and reproductive health services during disasters and humanitarian crises, and that healthcare professionals' awareness in this area directly influences the quality of service delivery (25, 26). However, it has also been reported that such awareness is often insufficiently translated into practice and structured service models. This discrepancy may help explain why, despite relatively high scores in the empowerment of women's health, overall SRH knowledge levels were found to be low in the present study. The low mean scores observed in the subdimensions related to the supply of materials, basic knowledge, and strategy and training components of the Minimum Initial Service Package point to a lack of operational knowledge regarding the implementation of SRH services in disaster and crisis settings. Studies published over the past five years have demonstrated that healthcare professionals often possess conceptual knowledge of the MISP; however, they experience substantial deficiencies in practice-oriented areas such as logistical planning, service organization, and intersectoral coordination (25, 28). This finding draws attention to structural barriers that limit the sustainability and effectiveness of SRH services in disaster contexts. Furthermore, the moderate total score on the Sexual Health Literacy Scale and the higher scores observed in the Sexual Knowledge subdimension compared with the Sexual Attitudes subdimension suggest that healthcare professionals may have cognitive knowledge but encounter difficulties in translating this knowledge into attitudes and behaviors. Current literature indicates that sexual attitudes are shaped not only by knowledge levels but also by cultural norms, professional identity, personal values, and societal perceptions of disability (29, 30). This is particularly relevant in disaster settings involving individuals with disabilities, where healthcare professionals' attitudes play a decisive role in determining the accessibility and inclusivity of services. The finding that participants demonstrated low levels of SRH knowledge alongside moderate levels of sexual health literacy indicates that education strategies based solely on information transfer are insufficient for improving SRH services in disaster and extraordinary situations. Recent studies emphasize the need for comprehensive educational approaches that simultaneously address knowledge, attitudes, ethical awareness, and practice-oriented skills in order to strengthen services for vulnerable and disabled populations (24, 26). Overall, this study demonstrates that the effectiveness of SRH services in extraordinary situations depends not only on healthcare professionals' knowledge levels but also on the multidimensional structure of sexual

health literacy. The findings underscore the necessity for disaster preparedness and response programs to address MISP components through more applied, inclusive, and rights-based approaches, and they offer important implications for making the sexual and reproductive health needs of persons with disabilities more visible in disaster contexts.

The finding that nurses demonstrated significantly higher levels of sexual and reproductive health (SRH) knowledge in extraordinary situations, as well as higher scores on the Empowerment of Women's Health subdimension compared with midwives, indicates that professional role differences markedly shape knowledge structures in disaster and crisis contexts. Nurses' more frequent involvement in hospital-based settings, acute care, and intensive care units likely results in greater exposure to disaster management, crisis intervention, and women's health–related knowledge and practices (24, 31). This professional exposure may be considered a key factor explaining nurses' higher SRH knowledge levels in extraordinary situations. In contrast, the higher total scores on the Sexual Health Literacy Scale (SHLS) and the Sexual Knowledge subdimension observed among midwives reflect the nature of midwifery as a profession fundamentally structured around reproduction, fertility, and sexuality. Previous studies have shown that midwives engage more extensively with sexual health counseling and sexual knowledge during antenatal and postnatal care processes, which contributes to greater depth of professional knowledge in this domain (27, 32). This finding supports the notion that sexual health literacy may vary according to areas of professional specialization. Participants with postgraduate education demonstrated significantly higher scores across SRH knowledge in extraordinary situations and across subdimensions including empowerment of women's health, knowledge of the Minimum Initial Service Package (MISP), and material supply for MISP implementation. These findings underscore the decisive role of educational level in shaping sexual health literacy and disaster preparedness. The literature indicates that postgraduate education enhances healthcare professionals' critical thinking skills, engagement with evidence-based practice, and awareness of health policies, thereby strengthening their knowledge and preparedness for disasters and crises (24, 28). Furthermore, higher scores among participants who requested in-service SRH training, perceived a need for SRH services during disasters, and reported knowledge of MISP and the Turkish Disaster Response Plan (TAMP) highlight the strong relationship between awareness and learning motivation. Recent studies have emphasized that although sexual and reproductive health services are frequently neglected during disasters and crises, healthcare professionals who recognize their importance demonstrate significantly higher levels of knowledge and preparedness (25, 26). The finding that postgraduate education was the only factor associated with significant differences in total sexual health literacy scores suggests that sexual health literacy extends beyond superficial knowledge acquisition and requires academic depth and an interdisciplinary perspective. Similarly, the prominence of postgraduate graduates and participants requesting in-service training in the Sexual Knowledge subdimension supports the importance of continuous professional education in the field of sexual health. Finally, the observation that higher Sexual Attitudes subdimension scores were found among participants requesting in-service SRH training and among those without knowledge of TAMP is consistent with the knowledge–attitude divergence frequently emphasized in the literature. Sexual attitudes are shaped not solely by knowledge levels but also by cultural norms, professional identity, and personal values (29, 30). This finding highlights the necessity of addressing SRH services for persons with disabilities and other vulnerable groups in disaster contexts through approaches that are not only knowledge-based but also explicitly aimed at transforming attitudes.

The findings of this study demonstrated significant positive associations between sexual health literacy and levels of sexual and reproductive health (SRH) knowledge in extraordinary situations. In particular, the strong correlations observed in knowledge-oriented subdimensions support the central role of literacy in healthcare professionals' ability to access and comprehend information related to health services and crisis contexts. Previous studies have shown that sexual health literacy among women of reproductive age is closely associated with both knowledge and attitudes, indicating that opportunities for information acquisition, the ability to manage risky behaviors more effectively among individuals with higher literacy levels, and access to reliable information sources and education are critically important (33–35). In contrast, the relationship profile observed between the attitude and knowledge subdimensions in the present study suggests that literacy is not limited to knowledge acquisition alone and that its translation into attitudes and behaviors is complex, as also emphasized in the literature. Moreover, sexual health literacy should not be viewed solely as an outcome of individual knowledge acquisition but rather as a construct that is directly linked to healthcare professionals' educational background and ongoing professional development. This pattern has also been observed in studies focusing on vulnerable populations, including women and persons with disabilities, where access to information alone may be insufficient to shape attitudes and behaviors due to the influence of social norms, stigma, and trust in the healthcare system (36–38). Although empirical research focusing specifically on extraordinary situations remains limited, the present findings align with the emerging literature emphasizing the critical importance of access to sexual and reproductive health and rights (SRHR) services and related knowledge during crises. The literature on sexual and reproductive health in emergency and disaster settings consistently demonstrates that the planning and implementation of these services are directly linked to social vulnerability. Policy documents and reports published by UNFPA and related organizations emphasize the necessity of supporting SRH services in emergencies and crisis situations through sustainable policies and structured implementation strategies. Within this framework, the findings of the present study suggest that increasing healthcare professionals' knowledge levels for disaster and extraordinary situations may not only enhance individual awareness but also positively influence service planning, resource allocation, and response capacity (34, 39, 40).

However, as empirical research directly examining the analytical use of SRH-related knowledge in disaster and extraordinary situations remains limited, future studies are recommended to systematically address sexual health literacy within disaster preparedness and response training programs, particularly with a focus on vulnerable populations.

Limitations

Because of the cross-sectional design of the study, it is not possible to draw conclusions regarding the direction or causality of the relationships between the variables. In addition, the study was conducted in a single public hospital, which may limit the generalizability of the findings to other healthcare settings or regions. Data were based on self-reported measures, which may be subject to recall bias and social desirability bias. Future research employing longitudinal and multi-center designs is recommended to better elucidate causal pathways and to enhance the external validity of the findings.

Conclusion

This study revealed that a substantial proportion of midwives and nurses working in a public hospital had low levels of sexual and reproductive health knowledge in extraordinary situations, whereas their levels of sexual health literacy were predominantly moderate. The findings suggest that although healthcare professionals possess cognitive awareness related to sexual health, significant gaps remain in translating this knowledge into practice within disaster and crisis contexts. The strong associations observed between postgraduate education, intensive care experience, and knowledge of the Minimum Initial Service Package (MISP) and the Turkish Disaster Response Plan (TAMP) with both knowledge and empowerment dimensions clearly highlight the critical role of education-based interventions in disaster preparedness. Overall, this study demonstrates that the effectiveness of sexual and reproductive health services during disasters and extraordinary situations depends not only on healthcare professionals' knowledge levels but also on the multidimensional structure of sexual health literacy. The findings offer important implications for the development of inclusive, accessible, and rights-based sexual and reproductive health services, particularly for persons with disabilities and other vulnerable populations.

Declarations

Acknowledgements

The authors thank the nurse managers who participated in this study fortheir valuable time, insights, and contributions.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to theresearch, authorship, and/or publication of this article

Funding

No funding.

Author Contributions

S.A designed the study, and S.A. and M.G.B. provided the data. S.A conducted data analyses and prepared tables. S.A and M.G.B. edited the manuscript and provided valuable comments. All authors wrote the mainmanuscript text and reviewed and approved the manuscript.

Data Availability Statement

The data that support the findings of this study are available on requestfrom the corresponding author. The data are not publicly available due toprivacy or ethical restrictions

Ethics Statement

Permission for the research was obtained from the Balikesir University Ethics Committee (date:xxxx; approval number:xxxx) and the Chief Physician of the hospital where the research was conducted. The study was carried out in accordance with the principles of the Declaration of Helsinki. The purpose of the study was explained to all participants, and data were collected after obtaining informed consent.

Consent for publication

Not applicable.

Consent to participate

The purpose of the study was explained to all participants, and data were collected after obtaining informed consent.

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