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Knowledge and Attitude of Kurdistan University of Medical Sciences Students towards Food Hygiene in Disasters

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ABSTRACT

Introduction: Ensuring access to nutritious and sanitary food is essential for maintaining health, particularly during disasters. This study aimed to assess awareness and attitudes towards food safety during disasters among Kurdistan University of Medical Sciences students.

Methods: This study was conducted in 2022 using a cross-sectional descriptive design. The sample consisted of 350 students from the Kurdistan University of Medical Sciences. The research tools comprised a demographic survey and a researcher-made questionnaire assessing students' knowledge and attitudes concerning food hygiene practices during disaster scenarios. Data analysis was performed using SPSS 24 and analyzed using descriptive statistics, analysis of variance, and independent t-test.

Results: The average age of the participants was 21.25 ± 3.17. The average knowledge and attitude scores of the Kurdistan University of Medical Sciences students regarding food hygiene during disasters were 80.80 ± 5.22 and 22.00 ± 10.51, respectively. A significant correlation was found between the knowledge level and the educational level of the participants. Television and radio were identified as the primary sources of information on food hygiene during disasters, while friends and family were the least utilized sources.

Conclusion: Based on the study findings, enhancing public education on food hygiene during disasters is recommended as a core curriculum in medical science universities. Public education should be widely implemented across various departments and faculties to reach a broader audience. Mass media, particularly radio, and television, should be prioritized for effective dissemination of information.

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Introduction

The human need for food is an innate physiological requirement and a fundamental factor for survival and longevity (1). This constant need drives organisms to seek nourishment and alleviate hunger (2). Access to nutritious and hygienic food is crucial for maintaining health under all circumstances (3), and this necessity becomes even more critical during disasters. Disasters can arise from natural events—such as earthquakes, landslides, volcanic eruptions, floods, hurricanes, tornadoes, blizzards, and tsunamis—as well as human-made incidents like transportation accidents, industrial mishaps, oil spills, and nuclear explosions or radiation exposure. Each event poses a substantial risk of harm and loss of life (4). The aftermath of disasters can have widespread impacts, including housing destruction, food shortages, transportation disruption, and social structure breakdown. Multiple factors contribute to food crises, such as adverse weather, natural disasters, economic instability, prolonged conflicts, fires, and water scarcity, and these may occasionally coincide to amplify the crisis (5-7). Given the persistent

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threat of disasters, governments must take proactive steps to establish national organizations that plan and prepare for relief programs. This preparation is essential to quickly and effectively respond to potential crises. Disaster and famine relief organizations thus have critical responsibilities, categorized into pre-crisis planning and in-crisis response (8).

Since the 1980s, the frequency of global food crises has significantly increased, with annual occurrences rising from 50 to 80 since 2000. Food safety during disasters is closely tied to population health, as compromised food supplies can lead to severe issues like foodborne illnesses (9). Proactive measures during crises can significantly impact the nutritional well-being of affected populations, influence the duration and severity of the disaster, and support regional food production resilience. Disasters often damage or destroy food warehouses, retail and wholesale food outlets, restaurants, and other facilities, resulting in spoilage and deterioration of food stocks. Power outages can exacerbate these issues by affecting cold storage, ice production, and food preparation facilities, leading to increased food waste and safety concerns (10).

Ensuring food quality presents challenges in emergencies, especially when laboratory services are unavailable. Food inspection in such situations often relies on appearance, physical condition, taste, and smell, as well as on standard characteristics and storage conditions. Nevertheless, precise testing is essential to assess whether food remains safe for human consumption, whether it is damaged but suitable for alternative uses such as animal feed, or if it is entirely spoiled and requires disposal (11). Governments play a vital role in disaster response by supporting and rebuilding food resources for affected individuals. The success of crisis prevention and management hinges significantly on organizational preparedness and coordination (12).

Effective crisis management also demands the involvement of healthcare professionals with specialized expertise. A critical factor in mitigating the impacts of food shortages during crises is these professionals' preparedness and knowledge level (11). This study, therefore, aimed to assess the knowledge and attitudes of students at Kurdistan University of Medical Sciences regarding food hygiene practices during disasters.

Material and Methods

This descriptive cross-sectional study was conducted in 2022 at Kurdistan University of Medical Sciences. The research population comprised all students enrolled at the university. A sample of 350 students was randomly selected using cluster random sampling. The sample size was determined based on similar studies and calculated using a statistical formula with a 95% confidence level (Z=1.96).

$$n = \frac{z^2 p(1-p)}{d^2}$$

Upon approval by the Research Committee, the Research Ethics Committee, and the Research Council at Kurdistan University of Medical Sciences, the researcher commenced data collection after receiving an official letter of introduction. Data were collected using a custom-designed questionnaire developed based on an extensive review of pertinent literature and sources. The questionnaire's validity was confirmed by a panel of five subject-matter experts specializing in health education, food hygiene, nutrition, disaster and emergency health, and environmental health. The Content Validity Ratio (CVR) was 0.99, and the Content Validity Index (CVI) for each item exceeded 0.79, ensuring strong validity. Reliability was further established through Cronbach's alpha, calculated after a pilot study with 30 students from the target group, resulting in Cronbach's alpha scores of 0.83 for the knowledge section and 0.85 for the attitude section. Demographic data collected included participants' age, gender, education level, economic status, university affiliation, and marital status, with confidentiality maintained throughout.

1. The questionnaire included two sections assessing students' knowledge and attitudes toward food hygiene during disasters. The knowledge section comprised 15 questions, where correct answers were scored as one and incorrect answers as zero, resulting in a possible knowledge score ranging from 0 to 15. Scores below 5 indicated weak knowledge, 5 to 10 indicated average knowledge, and scores above ten were considered good.
2. The attitude section consisted of 10 questions rated on a 5-point likert scale, from "completely

agree" to "completely disagree," scored from 1 to 5. This resulted in an attitude score range of 10 to 50, with scores between 10 and 23 indicating a weak attitude, 23 to 36 representing an average attitude, and scores above 36 considered good.

Data were analyzed using SPSS 24 software, applying descriptive statistics, independent t-tests, and analysis of variance, with a significance threshold set at 0.05. This study was part of a research project at Kurdistan University of Medical Sciences and was conducted with ethics approval under the code IR.MUK.REC.1401.330 from the University Ethics Committee.

Results

The average age of students in the study was 21.25 ± 3.17 years. Of the 350 students surveyed, the majority (63.15%) were female, and 46.28% fell within the 21-24 age range. Additionally, 57.72% of participants pursued undergraduate studies, with 30.58% enrolled in the health faculty. More than half (56%) reported average economic status, and 70.28% of participants were married. Table 1 provides an overview of the demographic characteristics of the surveyed students.

Table 1. Frequency distribution of demographic variables among students at Kurdistan University of Medical Sciences

Variable		Frequency	
		Number	Percent
Age	Less Than 21	86	24.57
	21 TO 24	162	46.28
	More Than 24	102	29.14
Gender	Male	129	36.85
	Female	221	63.15
Level Of Education	MSc	202	57.72
	BSc	106	30.28
	PhD	42	12
The Economic Situation	Good	97	27.71
	Medium	196	56
	Weak	57	16.29
Faculty	Medical	56	16
	Paramedical	57	16.28
	Dental	54	15.42
	Health	107	30.58
	Nursing-Midwifery	76	21.72
Marital Status	Single	246	70.28
	Married	104	29.72

Table 2. Mean and standard deviation of knowledge and attitudes scores of Kurdistan University of Medical Sciences students

Variable	Frequency (Number)	Range Of Average	Mean	SD
Knowledge	350	0-15	8.80	5.22
Attitude	350	10-50	22	10.51

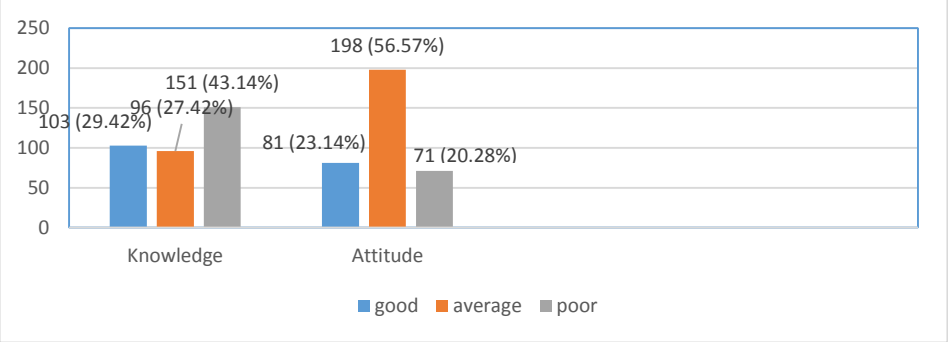

Figure 1. Score Frequency of knowledge and attitude among Kurdistan University of Medical Sciences students

As shown in Table 2, the average knowledge and attitude scores regarding food hygiene during disasters among Kurdistan University of Medical Sciences students were 8.80 ± 5.22 and 22.00 ± 10.51, respectively. Figure 1 illustrates that

29.43% of students demonstrated good food hygiene knowledge during disasters, 27.42% had average knowledge, and 43.14% exhibited poor knowledge. Regarding attitudes toward food hygiene during disasters, 23.14% of students had a good attitude, 56.57% showed an average attitude, and 20.28% had a poor attitude.

Table 3. Mean and standard deviation of knowledge scores and attitudes of Kurdistan University of Medical Sciences students based on demographic characteristics

Variable		Knowledge		Attitude	
		Mean	**SD**	**Mean**	**SD**
Age	<21	8.70	3.83	22.01	10.61
	21-24	8.40	5.15	2.96	10.41
	>24	8.86	5.24	23.64	10.48
P		0.12		0.13	
Gender	Male	8.25	5.19	21.03	10.82
	Female	8.73	5.16	21.65	10.36
P		0.09		0.11	
Education Level	BSc	6.24	5.13	21.34	10.41
	MSc	8.03	3.27	22.99	11.34
	PhD	10.29	5.07	22.69	8.62
P		0.00		0.38	
The Economic Situation	Good	8.96	3.50	20.96	10.36
	Average	8.37	5.58	21.72	10.66
	Poor	8.52	3.66	24.70	9.94
P		0.15		0.08	
Faculty	Medical	8.12	5.14	22.14	10.17
	Paramedicine	7.99	5.37	22.50	10.87
	Dental	8.65	5.34	22.16	10.98
	Health	8.09	4.72	22.42	10.44
	Nursing-Midwifery	8.35	5.39	22.92	10.47
P		0.17		0.13	
Marital Status	Married	8.69	5.20	22.86	10.10
	Single	9.03	5.29	22.83	10.14
P		0.58		0.21	

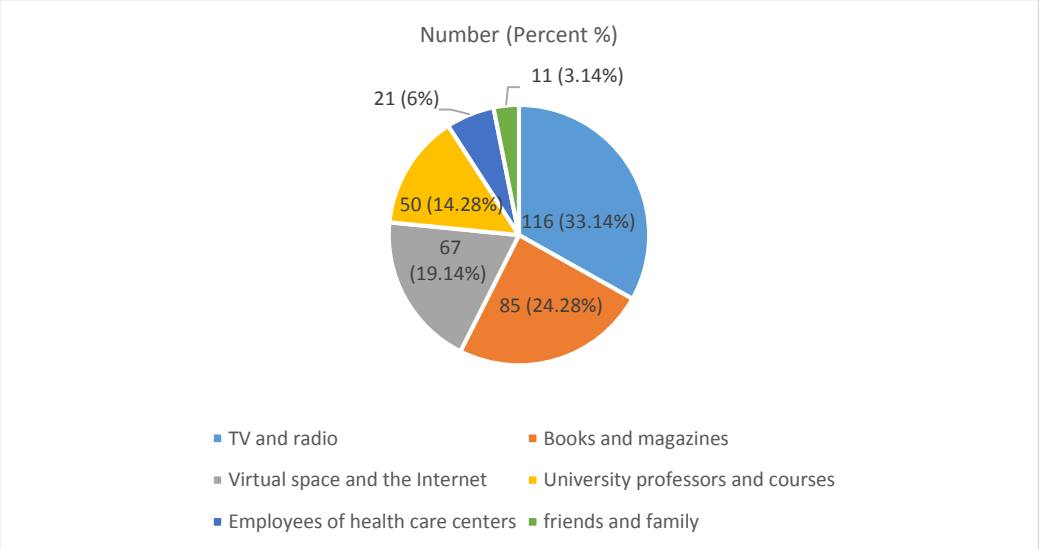

Figure 2. The distribution of information sources on food hygiene during disasters among Kurdistan University of Medical Sciences student

Table 3 shows a statistically significant relationship between students' educational level and their knowledge score on food hygiene during disasters.

As depicted in Figure 2, television and radio were the primary sources of information for students in the field of food hygiene during disasters, accounting for 33.14% of responses, while friends and family were the least utilized sources, with only 3.14% of respondents citing this channel.

Discussion

During the onset of a disaster, access to cooking facilities may become restricted due to severe food supply shortages. As a result, survivors may resort to consuming any available food simply to stave off hunger, often overlooking health concerns, which can lead to adverse outcomes. This study aimed to assess the knowledge and attitudes of students at Kurdistan University of Medical Sciences regarding food hygiene in disaster situations.

Students' average knowledge score for food hygiene during disasters was 8.80 ± 5.22. Among the participants, 29.43% demonstrated good knowledge, 27.42% moderate knowledge, and 43.14% had poor knowledge of food hygiene. Food safety becomes particularly critical during disasters. Supporting this, a study by Miri et al. in 2022 found that only 35% of participants had a comprehensive understanding of nutrition and proper food storage practices during disasters, while 38.5% had moderate knowledge, and 26.5% displayed limited knowledge in this area.

Biglari et al. (2022) found that 39% of participants firmly understood nutrition and food preservation in crises. Additionally, 35.5% exhibited moderate knowledge, while 25.5% had limited experience in this area. Similarly, research by Olamet (14) conducted during the COVID-19 pandemic revealed that only 20% of the workforce had adequate knowledge of food hygiene. Various studies have shown that unexpected global crises can significantly affect dietary habits, food safety awareness, and health behaviors.

Medical science students are vital in advancing public health in their future careers and will likely be frontline responders during critical situations. Therefore, this group needs to possess a strong knowledge of risk mitigation. Given the impact of crises on public health, incorporating disaster risk reduction management courses into medical science curricula is highly recommended to ensure preparedness and promote public health resilience.

The mean attitude score of Kurdistan University of Medical Sciences students regarding food hygiene during disasters was 8.80 ± 5.22. Specifically, 23.14% of students exhibited an excellent perception, 56.57% had an average perception, and 20.28% showed a poor perception of food hygiene in disaster conditions. Comparatively, studies by Islami (15) and Ulamat (14) found that 39.4% and 56% of participants demonstrated a positive perception of food hygiene. Low awareness and poor perception of health issues, especially during disasters, heighten the vulnerability of affected communities and can significantly impact health outcomes. This, in turn, leads to increased challenges and a higher incidence of foodborne illnesses following disasters. Thus, promoting awareness and fostering an accurate perception of food hygiene in adverse conditions is essential.

The findings of this study also reveal a significant correlation between students' educational level and their knowledge scores on food hygiene during disasters. This result is consistent with previous research by Marzban (16), Islami (15), and Hakoeh (17) but differs from studies by Bigleri (4), Miri (7), and Grover (18). The discrepancy may be due to increased exposure to relevant education and coursework among higher education students.

The primary sources of information for individuals regarding food hygiene during disasters were television and radio, while friends and family provided the least information. A review study by fauro et al. (19) in arab countries, examining public knowledge about food hygiene during the covid-19 pandemic, found that social media and local news were the primary sources of information. Similarly, research by marzban (16) and avahaj (20) highlighted cyberspace as the most significant source for acquiring nutritional knowledge during covid-19.

One strength of the present study is the inclusion of students across all five faculties at kurdistan university of medical sciences, enhancing the diversity of perspectives. However, a limitation is its descriptive nature, which does not allow for causative conclusions. Additionally, using a self-report questionnaire could introduce response bias, possibly affecting the accuracy of the findings. Since this study focused only on kurdistan university of medical sciences

students, the results may not be generalizable to other population groups.
Future research should aim to include a broader range of societal groups and consider intervention studies to assess the effects of educational initiatives on public awareness, attitudes, and behaviors regarding food hygiene in disaster contexts.

Results

The study's findings indicate that students surveyed generally had an average attitude toward food hygiene during disasters, highlighting a need for improvement. Research shows that educational interventions focused on food hygiene can enhance knowledge and foster positive changes in attitudes and practices. Therefore, it is essential to incorporate public education on food hygiene during disasters as a core subject in medical science programs and ensure its inclusion across various departments and faculties. Given the strong influence of mass media, particularly radio and television, in daily life, these channels should be leveraged to disseminate relevant information effectively. Based on students' attitudes, it is recommended to offer training classes structured around models and theories that shape attitudes. Additionally, organizing conferences, practical exercises, and exhibitions on disaster-related food hygiene within universities may further strengthen students' risk perception and preparedness.

Declarations

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Authors' Contributions

AM contributed to the research design and drafted and revised the manuscript; VR and MD conducted experiments and prepared tools and facilities for the field study; PE performed statistical analysis and drafted and finally revised the manuscript. All authors reviewed and approved the final draft of the manuscript.

Conflict of Interest

The authors stated no conflicts of interest.

Ethical Approval

The study protocol received approval from the Ethics Committee of Kurdistan University of Medical Sciences, Iran (IR.MUK.REC.1401.330).

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Informed Consent

The sample was selected through a lottery of student numbers after obtaining consent and providing necessary explanations.

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