

Health Care Providers' Practices Toward Waterborne Diseases In Al-Karkh District, Baghdad: A Cross-Sectional Study

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Abstract

Background: Waterborne diseases continue to be a major public health concern in developing countries, especially in areas with limited access to clean water and inadequate sanitation infrastructure. Healthcare providers play a critical role in mitigating these risks through education, prevention, and early detection efforts. This study aimed to evaluate the practices of healthcare providers in Al-Karkh District, Baghdad, regarding the prevention and management of waterborne diseases.

Methods: Between January and March 2025, 550 randomly chosen healthcare professionals from six hospitals and 25 healthcare institutions participated in a descriptive cross-sectional survey. A standardized questionnaire for interviews that focused on water safety procedures was used to gather data. The significance level was established at $p < 0.05$, and statistical analysis was conducted using IBM SPSS version 29.

Results: Regarding the prevention of waterborne diseases, the survey discovered that 43.3% of participants had good practices, 44.4% had acceptable practices, and 12.4% had bad practices. Practice levels were found to be significantly correlated with factors like age, education, years of experience, profession, length of training, and attitude ratings ($p < 0.05$). Practice levels, however, were not substantially correlated with facility type or knowledge scores.

Conclusions: The majority of healthcare professionals had acceptable practices score there are still training and awareness gaps. Enhancing waterborne illness prevention and control programs in Baghdad requires adopting focused training programs and enhancing provider education.

Keywords: Waterborne diseases, healthcare providers, public health, hygiene practices, Iraq, cross-sectional study

INTRODUCTION

Countries throughout the world are concerned with the effects of unclean drinking water -borne diseases are a major morbidity and mortality. Clean water is important for overall health and plays a substantial role in infant and child health and survival. Throughout the less developed part of the world, the proportion of households that use unclean drinking water source has declined, but it is extremely unlikely that all households will have a clean drinking water source in the foreseeable future ⁽¹⁾. These sources cause acute diarrhea diseases, typhoid, cholera, and so on, which are termed as waterborne diseases. ^(2,3) Waterborne diseases pose significant public health challenges worldwide, particularly in regions with inadequate sanitation infrastructure and limited access to clean water ⁽⁴⁾. In order to prevent the spread of diseases that are transmitted through water, it is essential to effectively monitor water sources. However, monitoring these sources and identifying vulnerable regions with waterborne diseases poses significant challenges. These difficulties are caused by a number of factors, such as the dynamics of waterborne diseases, insufficient infrastructure, and scarce resources. Due to the inadequate surveillance infrastructure, they are able to spread unnoticed until they reach dangerous levels.⁽⁵⁾Main way to prevent waterborne diseases by public health field are education about sanitation, hygiene, abundant availability of good quality water, good sanitary conditions and adequate disposal of human and animal excrements .Education and motivation to change people hygienic behavior should take place in the context of the family . People can protect themselves and others from water-related protozoan diseases by practicing good personal hygiene, which includes washing their hands before preparing and eating food, after going to the bathroom, after changing diapers, and before and after tending to someone who is sick ⁽⁶⁾.Even if there is an uninterrupted supply of microbiologically safe

water, it can be contaminated by consumers at the household level through the improper use^(7,8) Therefore, the water tanks must be clean and closed, it is necessary to clean and disinfect them on a regular basis. When collecting or storing water, it is not allowed for anyone to put one's hands into the water and drink directly from the water tank.⁽⁷⁾ If possible, water tanks should have a narrow neck and a stopper to avoid contact of water with hands, otherwise water must be taken from the tank with a ladle or a mug. In addition, it is necessary to use the available water to the end, and then rinse the tank thoroughly with clean water before next filling. Moreover, water for domestic purposes should be kept in tanks for as short a time as possible. With non-centralized water supply, people should be aware of how important it is to protect the source of water supply from contamination by pathogenic protozoa, and how to do so, as well as take responsibility for the safety of water they consume.⁽⁸⁾ People should keep wells closed when installing hand pumps and proper drainage, also keep jugs, jars and other utensils, which are used to collect and store water, clean and in clean places. It is critical to dispose of feces and sewage away from any source of water supply and build toilets according to a to the requirements.⁽⁶⁾ practices of health workers regarding water-related diseases play a vital role in providing people with related information about the prevention and controls, then they will be developed and formulate an appropriate recommendation to policy and decision makers on how best the water supply can be improved.⁽⁹⁾ All health team members play an important role in the prevention and treatment of waterborne diseases. They detect, assess of cases, supervision of their treatment. They diagnose and investigate the health problems and health hazards related to water pollution and inform, educate, empower people about these health issues and mobilize community partnerships to identify and solve health problems related to water. They develop policies and plan that support the individual and community health efforts and enforce laws and regulations that protect the health and ensure water safety. They link people to needed personal health services and assure the provision of health care when otherwise unavailable.⁽¹⁰⁾

METHODOLOGY

The present investigation was a descriptive cross-sectional study that evaluated the health provider's practice regarding water borne diseases in 6 hospitals and 25healthcare center located in Al-karkh side of Baghdad city. The study was performed from January 2025 till March 2025. The sample study consisted of 550 medical staff and health care workers who were randomly chosen among health providers who work in the hospitals and health care centers in Al-Karkh district in Baghdad city. Required data were collected onto the health provider's practice about waterborne diseases. For this purpose, a structured interview questionnaire was employed. The questionnaire was aimed at collecting data on "How to keep the water source, water collecting containers, and storage containers clean. This means that water is preserved from the source to the final consumer while being shielded from contamination. It consisted of 15 questions. The collected data were coded, entered, presented, and analyzed by computer using the available database software program statistical package of IBM SPSS-29 (IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA). Cronbach's alpha was used to examine the reliability of the questionnaire, and the results revealed a reliability of 88.5^(11,12).

Statistical Analysis

The collected data were coded, entered, presented, and analyzed by computer using the available data base software program statistical package of IBM SPSS-29 (IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA). Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). The significance of difference of different means (quantitative data) were tested using Students-t-test for difference between two independent means or Paired-t-test for difference of paired observations (or two dependent means), or ANOVA test for difference among more than two independent means. The significance of difference of different percentages (qualitative data) were tested using Pearson Chi-square test (χ^2 -test) with application of Yate's correction or Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal or less than 0.05^(11,12,13).

RESULTS

Table (1): Demographic characteristics of study sample

	No.	%
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Age (years)	20-29years	222	40.4
	30-39	194	35.3
	40-49	85	15.5
	50-59years	49	8.9
	Mean±SD (Range)	34.0±9.2 (22-59)	
Gender	Male	149	27.1
	Female	401	72.9
The years of practical work	1-4years	232	42.2
	5-9	120	21.8
	10-14	79	14.4
	15-19	43	7.8
	=>20years	76	13.8
	Mean±SD (Range)	9.0±8.5 (1-35)	
Educational Qualification	Institute/Diploma	163	29.6
	Bachelor's degree	354	64.4
	Mast/PhD degree	33	6.0
Profession	Medical	462	84.0
	Paramedical	88	16.0
Facility type	Hospital	360	65.5
	PHCC	190	34.5

The demographic characteristics of the study sample are shown in Table (4-1), where the current study was conducted on 550 healthcare providers with the mean ± SD of their ages being 34.0 ± 9.2 years, ranging from 22 to 59 years. The age group 20–29 years had the highest percentage (40.4%), while the age group 50–59 years had the lowest percentage (8.9%). Females represented the majority of the sample (72.9%) compared to males (27.1%). The highest percentage of participants held a bachelor’s degree (64.4%), followed by those with an Institute/Diploma (29.6%), while the lowest percentage had a Master’s/PhD degree (6.0%). Most respondents had 1–4 years of experience (42.2%), and the mean work experience was 9.0 ± 8.5 years, ranging from 1 to 35 years. The majority of healthcare providers were medical professionals (84.0%), while paramedical staff accounted for (16.0%). Most participants worked in hospitals (65.5%), compared to primary healthcare centers (PHCCs) (34.5%). This study also showed that the majority of participants (64.7%) had not received any training on waterborne diseases, while only (35.3%) had undergone training. Among those trained, the most common course duration was 5 days (53.6%),

The overall mean practice score was 57.5 ± 11.7, with scores ranging from 15 to 75 points. These findings indicate that while most healthcare providers maintained adequate to good practices in waterborne disease management, there remains room for improvement in standardizing preventive measures across all providers. The distribution of scores shows a balanced spread between acceptable and good practice levels, with a minority requiring additional training or support to enhance their implementation of waterborne disease control measures.

Table (2): Practices Score of Healthcare Providers in Dealing with Waterborne Diseases

Practices score of HC providers in dealing with water borne diseases	No.	%
Poor practice (<45)	68	12.4
Acceptable practice (45-60)	244	44.4
Good practice (>60)	238	43.3

Mean±SD (Range)	57.5±11.7 (15-75)
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Table 3: Association Between Healthcare Providers' Characteristics and Their Practices of Waterborne Diseases Prevention

		Practice Score						P value
		Poor (n=68)		Acceptable (n=244)		Good (n=238)		
		No.	%	No.	%	No.	%	
Age (years)	20-29years	27	39.7	116	47.5	79	33.2	0.009*
	30-39	27	39.7	84	34.4	83	34.9	
	40-49	8	11.8	27	11.1	50	21.0	
	50-59years	6	8.8	17	7.0	26	10.9	
Gender	Male	19	27.9	57	23.4	73	30.7	0.193
	Female	49	72.1	187	76.6	165	69.3	
The years of practical work	1-4years	28	41.2	122	50.0	82	34.5	0.034*
	5-9	18	26.5	51	20.9	51	21.4	
	10-14	9	13.2	31	12.7	39	16.4	
	15-19	5	7.4	13	5.3	25	10.5	
	=>20years	8	11.8	27	11.1	41	17.2	
Educational Qualification	Institute/Diploma	21	30.9	59	24.2	83	34.9	0.023*
	Bachelor's degree	45	66.2	173	70.9	136	57.1	
	Mast/PhD degree	2	2.9	12	4.9	19	8.0	
Profession	Medical	61	89.7	221	90.6	180	75.6	0.0001*
	Paramedical	7	10.3	23	9.4	58	24.4	
Facility type	Hospital	48	70.6	165	67.6	147	51.8	0.255
	PHCC	20	29.4	79	32.4	91	38.2	

*Significant difference between percentages using Pearson Chi-square test (χ^2 -test) at 0.05 level.

The relationships between healthcare providers' characteristics and their preventive practices are presented in Table (3). The sample included 68 providers (12.4%) with poor practices, 244 (44.4%) with acceptable practices, and 238 (43.3%) with good practices. A statistically significant association was found between age and practice scores ($p=0.009$), with younger providers (20-29 years) representing 39.7% of the poor practice group compared to 33.2% of the good practice group. Years of experience also showed significance ($p=0.034$), as providers with 1-4 years of experience were more common in the poor practice group (41.2%) than in the good practice group (34.5%). Education level was significantly associated with practices ($p=0.023$), with Master's/PhD holders more frequently demonstrating good practices (8.0%) compared to poor practices (2.9%). A strong association was observed for profession type ($p=0.0001$), where paramedical staff were more likely to have good practices (24.4%) than poor practices (10.3%). Among trained providers, training duration significantly influenced practices ($p=0.002$), with longer training (5+ days) correlating with better adherence to preventive measures.

Attitude scores showed a significant positive relationship with practices ($p=0.006$), as 88.2% of providers with good attitudes also had good practices, compared to only 70.6% in the poor attitude group. However, knowledge scores did not significantly affect practices ($p=0.267$). Other factors, including gender, facility type, and training status, showed no significant associations with practice levels. These findings suggest that while professional background and experience influence preventive behaviors, positive attitudes are strongly linked to better implementation of waterborne disease prevention measures.

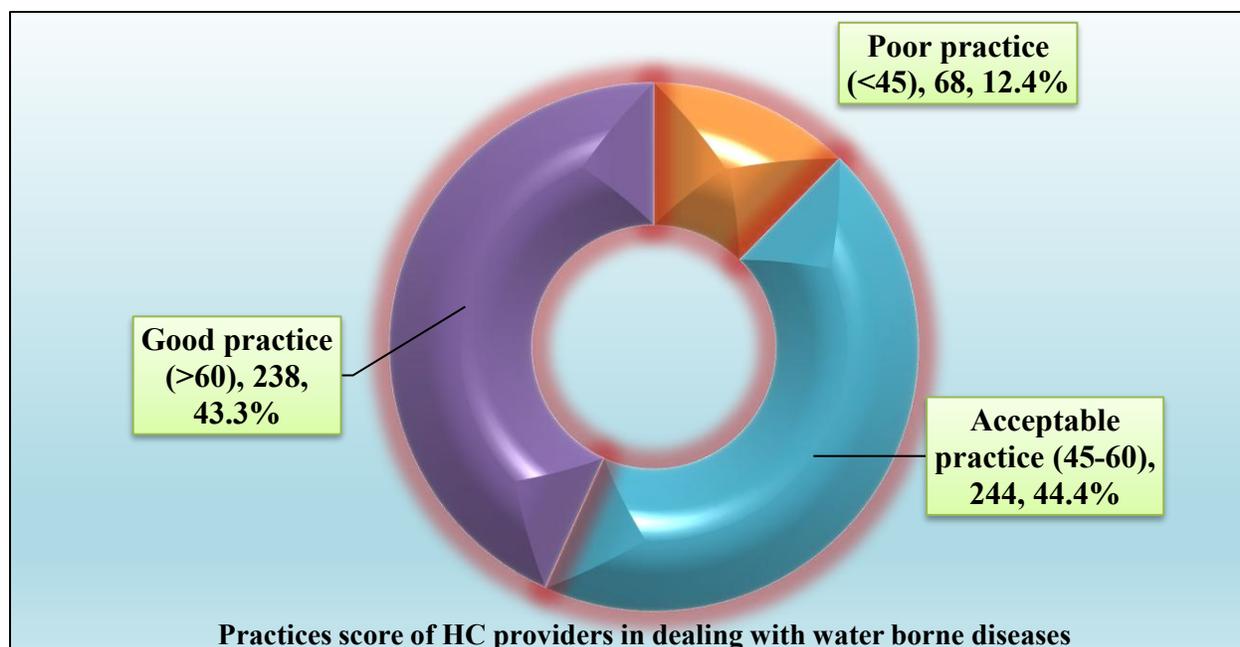


Figure 1: Shows practices score of healthcare provider
Higher percentages 44.4% had acceptable practices while lower percentages 12.4% had poor practices.

DISCUSSION

In the current study, the majority of participants were female. This finding is consistent with the results of^(10, 15, 16) confirmed that the majority of their participants were female. The average age in the current study was 34 ± 9.2 years, and the majority of the sample had 1–4 years of work experience. These findings dissent with⁽¹⁵⁾, who found that majority of their participants were aged 30–40 years. However, it also dissent with⁽¹⁰⁾, where most of the sample had 15–35 years of experience and only very few of them had 3–5 years. In the present study, most participants hold a bachelor's degree. This finding contrasts with⁽¹⁵⁾, who reported that half of their sample were institute graduates, and only few of them held bachelor's degrees. It is also discord with (Abd Elrazak et al., 2018), where the majority half of the sample held diplomas, and only a few of them had higher academic qualifications.⁽¹⁰⁾ also mentioned a small number of institute graduates, which partially supports the lower representation of technical-level education. A key finding in the current survey was that more than half of participants had not received any prior training related to waterborne diseases. This significantly contrasts with⁽¹⁸⁾, who reported that 80% of healthcare workers in their study had received either formal or informal training on topics such as hand hygiene, water treatment, storage, and related diseases. The fact that interviews were done at random can account for the variation in participant numbers, even though my study and other studies focused on comparable groups. Those that consented had the time and drive to take part in the survey. But even if there were enough people there, other people were frequently too exhausted, preoccupied with their work, or unwilling to join in when asked. The overall Healthcare providers' practice, attitudes and knowledge scores in dealing with waterborne diseases. The results show that providers demonstrated moderate practice, attitudes and good knowledge.^(18, 20) agreement with current study due to poor training.⁽²¹⁾ disagree with the present study that participants had good practice. providers with good attitudes also had good knowledge. The relationship between healthcare providers' characteristics and their preventive practices. Younger providers representing few of them had poor practice group compared to few had a good practice group education level, Master's/PhD holders more frequently demonstrating good practices (8.0%) compared to poor practices (2.9%).⁽²⁰⁾ The findings of our investigation had comparable outcomes with this study which show revealed notable associations between the practices of participants concerning water contamination and both their age and educational attainment. Consequently, the practices of health providers with regard to water contamination were influenced by age and education, but not gender.

CONCLUSIONS

The majority of healthcare professionals had acceptable practices score there are still training and awareness gaps. Enhancing waterborne illness prevention and control programs in Baghdad requires adopting focused training programs and enhancing provider education.

There were notable correlations found between the practices of the providers and variables like age, education, and work experience.

Recommendations

In order to improve healthcare provider's abilities to manage waterborne infections, these findings highlight the necessity of focused training initiatives and legislative changes. In areas with insufficient water sanitation infrastructure, increasing public health outcomes requires strengthening provider knowledge and practice.

Interest of Funding: Not funding

Ethical Clearance

Ethical approval was gained from the Middle Technical University Medical Ethics Committee with the reference number (MEC 74). Protecting the values and dignity of participants is one of the most basic principles before collecting data.

Conflict of Interest

The author acknowledges no conflict of interest in this study.

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