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Nurses' Knowledge about Dengue Fever at Al-Najaf Hospitals

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ABSTRACT

Background: Dengue fever is a significant global public health challenge, particularly in tropical and subtropical regions where the *Aedes* mosquito, the primary vector, thrives. Despite advances in medical science, dengue continues to pose a severe threat due to its rapid spread, potential for outbreaks, and associated morbidity and mortality. Nurses, as frontline healthcare providers, play a crucial role in the management, prevention, and education efforts related to dengue fever. Their knowledge and understanding of the disease are essential for effective patient care, accurate diagnosis, and timely intervention. **Objective:** This study aims to assess the current level of knowledge among nurses about dengue fever, which includes its symptoms, transmission, prevention strategies, and treatment protocols, in order to identify gaps and inform targeted educational initiatives. **Methods:** The study employed a cross-sectional study to assess nurses' knowledge regarding dengue fever in Al-Najaf city from September 2023 to April 2024. The study involved 219 nurses selected through non-probability convenience sampling from various wards in hospitals within Al-Najaf city. Data was collected using a questionnaire developed based on pertinent literature, comprising two sections: socio-demographic information and an assessment of nurses' dengue fever knowledge. Data collection involved both Google Forms and traditional questionnaire techniques. **Results:** The findings indicate that most nurses exhibit a satisfactory level of knowledge regarding dengue fever. Moreover, statistically significant relationships were observed between nurses' dengue fever knowledge and demographic factors, including age, gender, education level, years of experience, workplace, and sources of information. **Conclusion:** The study concluded that nurses' knowledge regarding dengue fever is generally fair, with significant associations to demographic factors, highlighting the need for enhanced education and training initiatives.

Keywords: Dengue Fever; Dengue Infections; Knowledge; Vectors

INTRODUCTION

Dengue fever (DF), a mosquito-borne viral illness, has become a significant global health concern, particularly in regions where Aedes mosquito vectors are prevalent (WHO, 2020). Dengue fever poses a considerable health burden in many parts of the world, affecting millions of individuals annually (Parveen *et al.*, 2023). Dengue fever cases in Latin America have surged by 437% compared to the five-year average. In recent years, the outbreak has expanded into southern Brazil and northern Argentina, regions where dengue was previously not a major concern. Brazil, Argentina, and Paraguay have reported the highest number of dengue cases among the 46 countries in the Americas in 2024 (Ly, 2024). Dengue fever is regarded as a major threat to public health (WHO, 2024). Several factors, such as inadequate medical services, rapid population growth, and climate change, have contributed to the increase in dengue fever cases. Five billion people are affected by the four hundred million cases of dengue that occur annually; in some areas, the death rate from the disease can reach five hundred twenty. Dengue fever is a problem in over one hundred nations, including the

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United States and Europe (Lee *et al*., 2020). The disease's symptoms can range in severity from minor to severe (Wang *et al*., 2020). It is a disease that is potentially dangerous for over half of the world's population and has become much more common in recent years. Dengue haemorrhagic virus (DHF) affects well over one hundred twenty nations and is a global public health burden. A startling five point two million dengue cases were documented in 2019 (Paul *et al*., 2021). Fifty persons are at risk of contracting dengue in 2022, with seventy cases coming from Asia (Wang *et al.*, 2020). Dengue infections are thought to kill up to thirty-six thousand people a year and impact three hundred ninety million people worldwide On August 2024, 2,597,067 cases and 2,065 deaths were recorded (Armenda *et al.*, 2021).

According to reports, the Philippines, Vietnam, and Brazil have the highest number of deaths. Since the last update, there have been well over 2,000 new cases and more than 2,000 additional deaths. According to recent studies Nearly one billion people globally are at high risk of getting the disease because they reside in tropical and subtropical regions (Adimy *et al*., 2020). Although one hundred million cases of conventional Dengue Fever (DF) are recorded annually, four hundred fifty thousand instances of Dengue Haemorrhagic Fever (DHF) are documented every year. Compared to Africa or America, Southeast Asia has a greater frequency of potentially fatal bleeding disorders (Kayesh *et al*., 2023). To treat and prevent DENV (Dengue Virus) infection, there is currently no licensed vaccination and no antiviral medication. Dengue Ffever (DF) and dengue haemorrhagic fever (DHF) continue to be global public health concerns. The disease's clinical presentation can range from mild flu-like symptoms to severe and potentially life-threatening complications, such as dengue haemorrhagic fever and dengue shock syndrome (Lee *et al*., 2020).

Dengue Haemorrhagic Fever (DHF) is a common tropical disease with rising cases in pregnancy. There is a report details of gravida 3, para 2 woman at 34 weeks gestation with DHF and dengue shock syndrome. With a history of two caesarean sections, she developed severe complications, including preterm labour and postpartum haemorrhage, requiring multidisciplinary care (Chigateri *et al*., 2025). The lack of specific antiviral treatments emphasises the pressing need for an effective dengue vaccine. Future research should focus on advancing vaccine development, improving accessibility, and ensuring widespread protection against the disease (Anumanthan, Sahay & Mergia, 2025).

Nurses are the frontline healthcare providers, offering support, comfort, and expertise to individuals in need. In the context of infectious diseases, such as dengue fever and coronavirus, nurses play a pivotal role in patient management, education, and prevention (Evans *et al*., 2023). Nurses, as integral members of healthcare teams, must possess a sound understanding of dengue fever to accurately diagnose, manage, and educate patients about the disease (Khan *et al*., 2023). Understanding and addressing nurses' knowledge regarding dengue fever is crucial in enhancing patient care, reducing the spread of the disease, and ultimately improving public health outcomes (Hossain *et al.*, 2021).

A study was done to assess the nurses' knowledge regarding dengue fever, aiming to identify potential knowledge gaps, assess the impact of ongoing education and training programmes, and highlight the critical role nurses in dengue prevention and management (Zida-Compaore *et al*., 2022). As frontline caregivers, nurses serve as the bridge between patients and healthcare systems, and their competence in recognising and responding to dengue fever is pivotal for timely diagnosis and effective care (Pérez *et al*., 2024). Moreover, nurses' knowledge can significantly influence public health initiatives aimed at preventing dengue transmission (Reza *et al.*, 2024).

A study showed that nurses reshaped their work environment during pandemic like COVID-19 through innovation and collaboration, gaining increased respect, autonomy, and management support (de Vos *et al.*, 2024). In this present research an exploration of nurses' knowledge regarding dengue fever was done to shed light on the existing strengths and areas for improvement in nursing education, as well as the impact on patient outcomes and public health efforts. This investigation has the potential to guide targeted interventions, educational strategies and policy changes that can enhance nurses' preparedness to confront the challenges posed by dengue fever, ultimately resulting in improved patient care and a reduced dengue burden in affected

regions. A study highlights the vital role of community nurses in dengue prevention through community empowerment and collaboration, especially in densely populated areas (Ambas *et al*.,2024).

Improved patient outcomes can be achieved when nurses with a strong understanding of dengue fever provide better care. Their knowledge ensures that patients receive timely and appropriate interventions, which impacts public health. Educated nurses contribute to public health by educating communities on dengue prevention (Ragab, Gaber & Hassan, 2020). Educated nurses can disseminate accurate information and promote preventive practices effectively. This information can be used to enhance the curriculum and training programs, ensuring that nurses are better equipped to manage dengue cases.

This study highlights the current level of nurses' knowledge regarding dengue fever, identifying key factors influencing their understanding, such as age, gender, education, experience, and workplace environment. The findings underscore the urgent need for continuous education and training programs to enhance nurses' competence in effectively managing dengue cases.

Significance of the Study

The significance of this study lies in its potential to inform healthcare policies, nursing curricula and public health strategies aimed at improving dengue fever awareness among nurses. By identifying gaps in knowledge, this research can contribute to the development of targeted educational programs that enhance nurses' preparedness, ultimately leading to better patient outcomes and more effective disease control.

METHODOLOGY

Study Design and Setting

A cross-sectional study was conducted to assess Nurses' Knowledge Regarding Dengue Fever in Al-Najaf city. The study was carried out from September 2023 to April 2024. The study included 219 nurses and was conducted in hospitals located in Al-Najaf city.

Sampling and Study Instruments

A stratified random sampling technique was employed to select nurses working across various wards in hospitals located in Al-Najaf city. A structured questionnaire was developed based on relevant literature to assess nurses' knowledge regarding dengue fever, with specific reference to the work of Liu, Fang and Xu (2021).

To ensure the validity of the instrument and its effectiveness in capturing the intended data, face validity was utilized. This was established through consultation with a panel of ten experts, each possessing more than ten years of professional experience in nursing and infectious disease management. These experts were invited to evaluate the questionnaire for relevance, clarity, and adequacy. Their feedback and suggestions were incorporated into the final version of the questionnaire to enhance its content validity and usability.

Data Collection Methods

Data were collected using Google Forms and traditional questionnaire techniques (Zida-Compaore *et al*., 2022). The questionnaire consisted of two main parts: the first part gathered socio-demographic information such as age, level of education, and occupation, while the second part assessed nurses' knowledge of Dengue Fever.

Instrument Reliability

The researcher used Internal Consistency Reliability to check the consistency of the measurement itself using Cronbach's alpha to determine that. By using Microsoft excel (2021) to fill in the data, the outcome was determined by using the SPSS Program (V 26) as the accepted value was 0.7 and the actual value 0.723 and the reliability technique was internal consistency.

Data Analysis

Descriptive statistical measures, including frequency and percentage, were employed for data analysis. Additionally, an inferential statistical approach utilising chi-square tests was used for further analysis.

Ethical Consideration

The research obtained Ethical clearance from the Research Ethics Committee of the College of Nursing, Warith Al-Anbiyaa University, Iraq with reference number 359 on 8th of July 2023.

RESULTS

Altogether, 219 nurses were enrolled from various wards in hospitals in this study. The majority of the study sample are age between 29 and 32 years (36.5%), Female (58%), living in urban residency (78.5%), completed nursing college (34.7%), have 6-9 years of experience (50.7%), and are working in hospital wards (35.6%). The majority of participants (63.9%) reported that their source of information about dengue fever was general knowledge or general culture as listed in Table 1.

Table 1: Descriptive Statistical Analysis (Frequencies and Percentages) of Demographic Data

Demographic Data		Frequency	%
Age	21-24 years	30	13.7
	25-28 years	62	28.3
	29-32 years	80	36.5
	33-36 years	16	7.3
	37-40 years	16	7.3
	49 years and above	15	6.8
Gender	Male	92	42.0
	Female	127	58.0
Residency	Urban	172	78.5
	Rural	47	21.5
Educational Level	Nursing preparatory school	15	6.8
	Nursing Institute	64	29.2
	Nursing college	76	34.7
	Postgraduate	64	29.2
Years of experience	2-3 years	62	28.3
	6-9 years	111	50.7
	10-13 years	15	6.8
	18-21 years	16	7.3
	26 years and above	15	6.8
Workplace	Emergency	62	28.3
	Hospital wards	78	35.6
	Operating rooms	48	21.9
	Isolation	0	0
	Health centre	31	14.2
Source of information about dengue fever	General culture	140	63.9
	Social media	48	21.9
	Friends	0	0
	Workshops	0	0
	Academic study	31	14.2
	Continues education	0	0
Total		**219**	**100**

An attempt has been made to analyse the nurses' responses to individual statements (Table 2). It was found that a good level of knowledge for study item 1,6,7,9,10,13,19,20, and a fair level of knowledge for item 2,3,4,5,8,15,16,22. While it was found that only item 11,12,14,18,21 got a poor level of knowledge among the study participants.

Table 2: Frequency Distribution of Nurses' Knowledge Regarding Dengue Fever Items

Knowledge Regarding Dengue Fever			Frequency	%	Mean Score (MS)	Standard Deviation (SD)	Assessment
Q1	What is the main mode of transmission of dengue fever?	Wrong answer	48	21.9	0.78	0.415	Good
		Correct answer	171	78.1			
Q2	Which type of mosquito is the main vector for transmitting dengue fever?	Wrong answer	125	57.1	0.43	0.496	Fair
		Correct answer	94	42.9			
Q3	What viral group does dengue virus belong to?	Wrong answer	127	58.0	0.42	0.495	Fair
		Correct answer	92	42.0			
Q4	When do dengue symptoms usually appear after the bite of an infected mosquito?	Wrong answer	111	50.7	0.49	0.501	Fair
		Correct answer	108	49.3			
Q5	What is a common symptom that dengue fever does not include?	Wrong answer	127	58.0	0.42	0.495	Fair
		Correct answer	92	42.0			
Q6	What is the most severe type of dengue known as?	Wrong answer	46	21.0	0.79	0.408	Good
		Correct answer	173	79.0			
Q7	How is dengue fever diagnosed?	Wrong answer	16	7.3	0.93	0.261	Good
		Correct answer	203	92.7			
Q8	What is the recommended treatment for dengue fever?	Wrong answer	79	36.1	0.64	0.481	Fair
		Correct answer	140	63.9			
Q9	What should patients refrain from taking due to the risk of increased bleeding?	Wrong answer	31	14.2	0.86	0.349	Good
		Correct answer	188	85.8			
Q10	When we want to prevent dengue fever, we focus on:	Wrong answer	47	21.5	0.79	0.411	Good
		Correct answer	172	78.5			
Q11	Which of the following is a recommended measure to prevent dengue fever?	Wrong answer	203	92.7	0.07	0.261	Poor
		Correct answer	16	7.3			
Q12	When does dengue fever usually occur?	Wrong answer	173	79.0	0.21	0.408	Poor
		Correct answer	46	21.0			
Q13	In severe cases, what complications may dengue fever lead to?	Wrong answer	63	28.8	0.71	0.454	Good
		Correct answer	156	71.2			
Q14	What is the recommended course of action for travellers to areas where dengue fever is common?	Wrong answer	204	93.2	0.07	0.253	Poor
		Correct answer	15	6.8			
Q15	Which type of mosquito is most likely to transmit dengue virus to humans?	Wrong answer	142	64.8	0.35	0.479	Fair
		Correct answer	77	35.2			
Q16	What is the main measure to control the spread of dengue fever?	Wrong answer	111	50.7	0.49	0.501	Fair
		Correct answer	108	49.3			
Q17	Which of the following is not a common symptom of dengue haemorrhagic shock syndrome?	Wrong answer	173	79.0	0.21	0.408	Poor
		Correct answer	46	21.0			
Q18	What type of test is used to detect the presence of antibodies against dengue virus in the blood?	Wrong answer	189	86.3	0.14	0.345	Poor
		Correct answer	30	13.7			
Q19	Which of the following is not a common symptom of dengue fever?	Wrong answer	61	27.9	0.72	0.449	Good
		Correct answer	158	72.1			
Q20	What should individuals do if they suspect they have dengue fever?	Wrong answer	64	29.2	0.71	0.0456	Good
		Correct answer	155	70.8			
Q21	What is the most effective way to avoid annoying mosquito bites during the day?	Wrong answer	158	72.1	0.28	0.449	Poor
		Correct answer	61	27.9			
Q22	What type of test is used to detect the presence of dengue virus in the blood?	Wrong answer	77	35.2	0.65	0.479	Fair
		Correct answer	142	64.8			

Poor: MS = <0.33; Fair: MS =0.34-0.67; Good: MS≥0.68

Table 3 presents the overall assessment of nurses' knowledge levels regarding dengue fever based on cumulative scoring. The results indicate that a significant portion of the study participants demonstrated a fair level of knowledge (43.4%), followed by good knowledge (34.7%), and a smaller group with poor knowledge (21.9%). The mean score for the overall knowledge was 0.51, which falls within the "fair" range as per the study's predefined scale (Poor: MS < 0.33, Fair: MS = 0.34–0.67, Good: MS ≥ 0.68).

This distribution reflects a moderate understanding of dengue fever among the nursing staff, suggesting partial awareness of critical aspects such as transmission, symptoms, prevention, and treatment protocols. While the fair and good categories combined make up over 78% of the sample, the presence of 21.9% in the poor knowledge category indicates a need for targeted interventions, refresher training, and continuing education programs to bridge knowledge gaps and improve competency in managing dengue cases effectively.

Table 3: Frequency distribution of overall Items of Knowledge Regarding Dengue Fever

Variables		Frequency	%	Mean of Score (MS)	Assessment
Knowledge Regarding Dengue Fever	Poor	48	21.9	0.51	Fair
	Fair	95	43.4		
	Good	76	34.7		

Poor: MS = <0.33; Fair: MS =0.34-0.67; Good: MS≥0.68

Table 4 presents the relationship between nurses' sociodemographic characteristics and their knowledge levels regarding dengue fever. A statistically highly significant association ($p = 0.000$) was observed between age and knowledge level. Nurses aged 29–32 years predominantly demonstrated fair knowledge, while older nurses (37 years and above) were more likely to possess good knowledge. Gender also showed a significant relationship with knowledge levels; male nurses had a notably higher proportion of good knowledge compared to females, who mostly exhibited fair knowledge. Similarly, educational level was strongly associated with knowledge scores; nurses with a college or postgraduate education were more likely to demonstrate good knowledge, while those from nursing institutes or preparatory schools were mainly in the fair or poor categories.

Years of experience also played a significant role, with nurses having 6–9 years of experience showing the highest representation in the fair and good categories. Those with more than 18 years of experience were primarily in the good knowledge group, indicating that extended clinical exposure contributes to enhanced understanding. Regarding the workplace, nurses working in hospital wards and operating rooms showed higher levels of good knowledge compared to those in health centres, who mostly demonstrated poor knowledge. This may be due to the higher exposure to dengue-related cases and training opportunities in hospital environments.

In terms of source of information, nurses who gained knowledge from general culture (e.g., media and public awareness) and academic study tended to have better knowledge levels. Those relying on social media showed limited representation in the good knowledge group. On the contrary, residency (urban vs. rural) did not exhibit a statistically significant relationship ($p = 0.069$) with knowledge level, suggesting that living location had no substantial impact on their understanding of dengue fever. Overall, the findings emphasize that age, gender, education, experience, workplace, and source of information significantly influence nurses' knowledge of dengue fever, highlighting the importance of structured education and training.

Table 4: Relationship between Demographic Data and Knowledge Regarding Dengue Fever

Demographic Data		Knowledge Regarding Dengue Fever			Chi-square value (χ^2)	*df*	*p*-value
		Poor Freq.	Fair Freq.	Good Freq.			
Age	21-24 years	0	15	15	141.09	10	0.000 (HS)
	25-28 years	16	16	30			
	29-32 years	32	48	0			
	33-36 years	0	16	0			
	37-40 years	0	0	16			
	49 years and above	0	0	15			

Gender	Male	15	16	61	72.63	2	0.000 (HS)
	Female	33	79	15			
Residency	Urban	32	79	61	5.35	2	0.069 (NS)
	Rural	16	16	15			
Educational Level	Nursing Preparatory School	0	0	15	106.69	6	0.000 (HS)
	Nursing Institute	16	32	16			
	Nursing College	0	31	45			
	Postgraduate	32	32	0			
Years of Experience	2-3 years	16	31	15	124.10	8	0.000 (HS)
	6-9 years	17	64	30			
	10-13 years	15	0	0			
	18-21 years	0	0	16			
	26 years and above	0	0	15			
Workplace	Emergency	0	47	15	201.53	6	0.000 (HS)
	Hospital lobbies	0	48	30			
	Operating rooms	17	0	31			
	Isolation	0	0	0			
	Health centre	31	0	0			
Source of Information	General culture	32	47	61	40.79	4	0.000 (HS)
	Social media	16	32	0			
	Friends	0	0	0			
	Workshops	0	0	0			
	Academic study	0	16	15			
	Continues education	0	0	0			

p-value <=0.05 (significant); p-value > 0.05 (non-significant) (HS: high significant) (NS: non-significant)

DISCUSSION

The study represents a methodically structured understanding and reasonably derived study results regarding nurses' knowledge related to dengue fever and the relationship between them and their sociodemographic data. Most of the study sample's age was between 29–32 years (36.5%), likely because individuals in this age group were the most interested in the topic of research, resulting in their predominance among participants. This result aligns with Yusuf and Ibrahim (2019), who found that 93% of their study sample were aged between 21–40 years. Females constituted the majority of participants (58%), as most nursing and medical fields in Iraq are predominantly female. This finding closely mirrors the results of Kajeguka *et al.* (2017), who reported that 78.4% of their study sample were female.

The majority of the study sample resided in urban areas (78.5%). This could be due to urban residents having greater interest in the topic. However, this result contrasts with Aldeib and Saied (2020), who found that 68.9% of their study sample resided in rural areas. The higher percentage of nurses in urban hospitals may be attributed to the limited healthcare infrastructure in rural areas; up to 80% of nurses are concentrated in urban centres in some countries. In terms of education, most participants had either completed or were attending college (34.7%), which aligns with their age group. Yusuf and Ibrahim (2019) similarly found that 65% of their sample held a bachelor's degree in nursing. Years of experience in this study ranged mostly between 6–9 years (50.7%), correlating with the participants' age group and the relatively short time between graduation and employment. Handel *et al*. (2016) reported that most participants had 1–4 years of job experience (34%).

The largest proportion of participants (35.6%) worked in hospital wards, likely due to the opportunities for communication and interaction with patients as well as perceived work comfort. Nana-Ndjangwo *et al*. (2021) found that 51.3% of healthcare workers worked in public facilities, while Mohamed (2017) found that 47.1% worked in surgical wards. A significant percentage (63.9%) of nurses obtained their information about dengue fever from general media, reflecting the widespread accessibility of media via television, mobile phones, and advertisements. Nikookar *et al.* (2023) similarly reported that 83.8% of participants had prior knowledge of dengue fever from media exposure.

Overall, nurses' knowledge about dengue fever was categorised as fair (43.4%), with 34.7% achieving

good knowledge and 21.9% classified as poor. This distribution could result from various contributing factors. Mane (2016) found that nurses scored significantly higher in dengue fever knowledge compared to the general public ($p < 0.001$). Similarly, Bimal, Kaur and Kaur (2016) found that 86% of participants had good knowledge, while 14% had average knowledge.

Nurses' age ($p = 0.000$) and educational level ($p = 0.000$) were significant factors associated with their knowledge levels. Older nurses often accumulate more knowledge and experience over time compared to their younger counterparts. Al-Jabri and Al Jawfi (2023) also found a significant relationship between age, educational qualifications, and knowledge about dengue fever. Years of experience ($p = 0.000$) and workplace ($p = 0.000$) were also significant factors. Nurses with more years of experience, especially those working in clinical settings, tended to have higher knowledge levels due to increased exposure to cases and information. Mutheneni *et al*. (2017) pointed out the importance of years of experience, while Mohamed (2017) reported a correlation between workplace and knowledge.

In the current study, previous information was found to be a significant factor influencing nurses' knowledge ($p = 0.000$). This can be attributed to the fact that most participants had prior knowledge before taking part in the study. Using a statistical program and applying a one-way ANOVA test to compare the means, it was determined that previous information had a direct impact on nurses' knowledge. To the best of the researchers' knowledge, this is the first study to report a significant relationship between this variable and nurses' knowledge.

Limitation

This study only looked at the role of hospital nurses and did not discuss clinical instructors and nursing students. Furthermore, the cross-sectional design limits the ability to draw causal conclusions. Further research with a larger, more diverse sample is needed to confirm these results.

CONCLUSION

According to the study's findings and discussion, it concluded that the majority of the study nurses' knowledge regarding dengue fever is fair, and there is a statistically highly significant relationship between nurses' knowledge regarding dengue fever and their age, gender, educational level, years of experience, workplace and source of information. Based on the study's conclusions, it is recommended that nurses be educated and motivated to engage in continued education. Additional teaching programs and educational courses are needed to increase awareness and knowledge about dengue fever.

Recommendation

Further studies should be conducted regarding nurses' knowledge about dengue fever in a larger range and area. The Ministry of Health should use mass media to enhance nurses' knowledge about dengue fever. The Ministry of high education should support and include dengue fever in curricula to increase students' knowledge and awareness. Emphasizing a collaboration between the Ministry of Health and the Ministry of Higher Education to lead more research-based practice topics about dengue fever.

Conflict of Interest

The authors declare that they have no competing interests.

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