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Nurses' knowledge regarding Crimean-Congo hemorrhagic fever (CCHF): Cross-sectional study

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ABSTRACT

Crimean-Congo-hemorrhagic-fever (CCHF) remains to lead and real hazard to the delicate health-care-systems with a constant rise of diseases and death. The CCHF is caused by viruses such as Ebola hemorrhagic fever. The present study aimed to assess Nurses' Knowledge Related to Crimean-Congo Hemorrhagic Fever. A descriptive cross-sectional design was carried out in Al-Hillah Teaching Hospital, Babylon, Iraq. A purposive (non-probability) sample was selected (70) nurses included (38 and 32) males and females respectively from nurses at the Al-Hillah teaching hospital. The study showed that the average age is 26.47 (± 4.77) years, and the age group 20-24 years was the highest recorded (72.9%). About gender, more than half of the study participants were male nurses (54.3%). Concerning the education level, most of the participants were diploma graduates (54.3%). In regard to years of experience, those with less than 5 years were predominated (71%). Residents related findings; the majority of participants were urban (81.4%). The results of the present study also demonstrated that the majority of (95.7%) nurses expressed a fair knowledge regarding Crimean-Congo hemorrhagic fever. The findings of the present study reflected insufficient levels of knowledge among nurses relating to CCHF. Study results showed that it is vital to continuously assess all health care providers' knowledge and also there is a need to improve the awareness by educated seminars, workshops about present endemic diseases to forthcoming health care providers.

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Introduction

A large outbreak of severe hemorrhagic fever was started in the Soviet Union's Crimean Peninsula in 1944." A patient in the Congo, Africa, had a virus with a similar pathophysiology that was identified in her in 1956, some years later. After some time, it was determined that the two

viruses had the same conditions, and the virus was subsequently identified as the Crimean-Congo hemorrhagic fever virus (CCHFV) (Hoogstraal 1979, Ayebare et al., 2023).

Africa, the Balkans, the Middle East, and Asia are the endemic regions for Crimean-Congo hemorrhagic fever.

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There is a three billion to one chance of contracting hemorrhagic fever in the Congo. There are projected to be 500 deaths per year and 10,000 to 15,000 cases of predictable Congo hemorrhagic fever. Since the first case was reported in 1979, Iraq, in particular, has evolved into an endemic location for CCHF. Iraqi health officials report several instances of CCHF each year, but in the first half of 2022, concerns were raised due to the disease's increasing prevalence. Between January 1, 2022, and May 29, 2022, Iraq reported 212 instances of CCHF. This was six times as many as in 2021, when there were just 33 occurrences recorded for the entire year. Of these 212 instances, 97 (46%) have laboratory confirmation, and 115 (54%) are suspected cases. Thus far this year, there have been 27 deaths linked to CCHF, of which 14 were suspected cases and 13 were verified by laboratory testing. Nearly half of these instances were reported from the Thi-qar governorate ($n = 47$) in southeast Iraq; the remaining cases occurred in twelve other governorates. (Rathore *et al* 2021, Jafar *et al.* 2022).

The **Ixodes tick** transmits the Narivirus, a member of the Bunyavirus family that causes Crimean-Congo hemorrhagic fever. Based on clinical considerations, the typical course of CCHF infection is divided into four stages: incubation, PR hemorrhagic, hemorrhage, and recovery. The rapid (3–7 day) development period lasts from the moment of CCHFV exposure to the PR hemorrhagic stage, which is indicated by increasing viremia. (Gruber *et al.* 2019, Mardani *et al.*, 2022).

Early studies revealed a connection between the distribution pathway and the incubation time. As a result, patients who were bitten by a tick and who were not shielded from contaminated blood or cattle tissue had viremia more quickly. The pre-hemorrhagic stage begins quickly and lasts for three days. Fever, headache, myalgia, and dizziness are all common at this time. The next hemorrhagic period is brief, develops swiftly, and is marked by petechiae and bleeding from the respiratory tract, gastrointestinal tract, nose, and urine tract. The convalescing phase for living individuals starts 10–20 days following the onset of the illness. (Binay & Özakgöl 2020).

Through synchronism in zoonotic niche situations or co-feeding on a vertebrate host, this virus can spread among ticks both vertically (from one group to the next) and horizontally (immediate circulation of the virus from one bloodsucking infected tick period near another clean one). It is also typical for viruses to spread by the venereal (trans-sexual), ovarian (through eggs), and stadial (from one molting tick blood-feeding phase to the next developing phase) routes. The multiplicity of viral transmission pathways and orientations is indicative of the broad CCHF epidemiology (Berber *et al.*, 2021)

It is crucial to identify CCHF early and precisely for the patient's survival as well as for prompt recovery. Molecular approaches for the identification of CCHFV RNA are the primary means of achieving laboratory diagnosis during the acute phase of the disease; antigen detection and viral isolation (in high containment facilities) are also important factors in this regard. There have been reports of long-term CCHFV RNA detection, but generally speaking, molecular techniques are beneficial within the first week of the disease. The great genetic variability of CCHFV strains may compromise the diagnostic capacity of molecular assays by reducing their effectiveness (Gargili *et al.*, 2017).

The European Medicines Agency has licensed no vaccination for the EU/EEA market that violates CCHF. Nonetheless, Bulgaria uses a vaccination derived from inactivated CCHFV that spreads in mice brains. There are now several changes being made to the vaccination expansion (Geisbert *et al.*, 2003). Infection prevention and staff education are essential in hospital environments. Training on barrier nursing techniques and PPE use (such as goggles, gloves, respirator masks, and waterproof gowns) is included in this. To stop the infection from spreading further, contact tracing is crucial. Generally speaking, it is imperative to adhere to the recommendations made for the treatment and management of viral hemorrhagic fevers (Ergonul *et al.*, 2006, Eljamay *et al.*, 2022).

The objective of this study was to assess the knowledge of nurses regarding Crimean-Congo Hemorrhagic Fever (CCHF) and to identify gaps in awareness that could inform future educational initiatives for healthcare providers.

Material and Method

Study design and sample

A descriptive cross-sectional study was conducted to assess Nurses' Knowledge Regarding Crimean-Congo Hemorrhagic Fever. It was carried out in Al-Hillah Teaching Hospital, Babylon, Iraq, for the period from September 1, 2022, to June 1, 2023.

A purposive (non-probability) sampling technique was used to select 60 nurses, including 38 males and 32 females, from Al-Hillah Teaching Hospital, Babylon, Iraq.

Study instrument

A verbal consent with a self-administered constructed questionnaire contains three parts: Part I contains (age, gender, marital status, education levels, clinical works, years of experience, and residential). Part II: Concerned with knowledge about Crimean-Congo Hemorrhagic Fever, which is composed of (36) items

measured on (3) for the correct answer, (2) for the middle answer, and (1) for the wrong answer. Part III: Linear Regression among the study variables in predicting the nurses knowledge.

Statistical analyses

The data from the study is evaluated with the use of the "Statistical Package for the Social Sciences" (SPSS - version 24). Through the use of descriptive statistics to analyze the distribution of characteristics of the study, which contains frequencies, percentages, and standard deviation, and an inferential statistical approach to analyze the relationship of knowledge with demographic data, including the chi-squared test

Ethical considerations

The nurses' identities were not divulged to maintain research ethics, and the data were examined collectively.

Results and Discussion

This study included 70 nurses from Al-Hillah Teaching Hospital (Table 1). The average age of participants was 26.47 years (± 4.77), with the majority falling in the 20–24 age group (72.9%). More than half of the sample were male nurses (54.3%). In terms of education, the largest proportion were diploma graduates (54.3%). Most participants reported less than five years of nursing experience (71%), and the majority resided in urban areas (81.4%).

With regard to knowledge, the results showed that almost all participants (95.7%) demonstrated only a fair level of knowledge about Crimean-Congo Hemorrhagic Fever, with a mean score of 66.34 (± 6.11). This indicates that while awareness of the disease exists, the depth of understanding remains limited (Table 2).

To explore factors influencing knowledge levels, linear regression analysis was performed. The findings revealed that both age ($p = .000$) and years of experience ($p = .019$) were significant predictors of nurses' knowledge about CCHF. In practical terms, this means that younger nurses and those with fewer years of professional experience tended to have lower knowledge scores compared to their older and more experienced colleagues (Table 3).

These findings underscore the importance of targeted educational interventions, particularly for early-career nurses, to ensure that all healthcare providers are adequately prepared to recognize, prevent, and respond to CCHF outbreaks.

Table 1. Socio-Demographic characteristics of study participants (n = 70)

SDVs	Classification	No.	%
Age	20-24 years	51	72.9
	25-29 years	18	25.7
	30-34 years	1	1.4
		26.47 \pm 4.77	
Gender	Male	38	54.3
	Female	32	45.7
	School nursing	31	44.3
Education level	Diploma	38	54.3
	nursing		
	B.Sc nursing	1	1.4
Marital status	Single	1	1.4
	Married	69	98.6
	Less than 5 years	50	71.4
Years of experience	5-10 years	19	27.1
	>10 years	1	1.4
	Urban	57	81.4
Residents	Rural	13	18.6

Table 2. Nurses' knowledge regarding Crimean-Congo Hemorrhagic Fever virus

Knowledge	No.	%	M (\pm SD)
Poor	2	2.9	66.34 \pm 6.11
Fair	67	95.7	
Good	1	1.4	
Total	70	100.0	

M: Mean for the total scores, Standard deviation for the total scores

Table3. Linear regression among the study variables in predicting the Nurses' knowledge

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	S.E.	Beta		
Age	.007	.070	.017	.102	.919
Gender	-.027-	.055	-.066-	.496	.621
Marital status	-.018-	.053	-.045-	.333	.741
Education level	-.123-	.033	-.218-	3.727-	.000
Years of experience	.080	.034	.137	2.351	.019
Residents	.011	.074	.020	.145	.885

The present study was the first countrywide study to examine the knowledge. Previous studies had a small number of members or were limited to healthcare providers. The research showed that about the common of participants of the study (95.7%) nurses expressed a fair knowledge regarding Crimean-Congo hemorrhagic fever (CCHF) $66.34(\pm 6.11)$, in same aspect another study which was carried out at three schools in Sindh that reveal about 90.4% of members had at no time perceived regarding "Congo". Also, a study of the overall public of Rawalpindi discovered that 37% of the people were ignorant of the word "Congo" (Ahmed *et al* 2021).

Understanding the illness is the initial step in implementing any health teaching program. It raises the chance that people will become further alert of the outbreak of infectious illnesses, and of the preemptive actions to slow the spread. When people are aware of the reasons and spread causes of a disease. 2.9% of the study's contributors who had heard of CCHF were not well-informed about the organization. 1.4% of participants were unaware that CCHF was originally described in Crimea. 95% of participants were not aware that Baluchistan is where the majority of CCHF cases are reported. Since 2000, there have been at least 14 occasional outbreaks reported, nine of which occurred in the province of Balochistan, where the majority of the population lacks formal education. Most of them were shepherds by profession and knew very little about CCHF disease prevention. Moreover, Baluchistan's healthcare workers (HCWs) also lacked enough CCHF understanding. This can be the result of a shortage of knowledgeable personnel, essential medications, and CCHF-related laboratory supplies. According to Turkish research, 71% of respondents had a sufficient understanding of the symptoms, and 72.3% of respondents believed that CCHF is contagious (Shahhosseini *et al* 2021).

The majority of respondents thought that there was a higher chance of contracting the illness during Eid al-Adha. Most instances are identified seldom each year, primarily around Eid al-Adha. Cattle are moved from rural areas to cities during this time of year. This makes it possible for the CCHF virus to be transmitted by careless handling of live animals and excessive contact with animal blood following slaughter (Ahmed *et al.*, 2021).

This study found a strong correlation between nurses' awareness of the Crimean-Congo Hemorrhagic Fever (CCHF) virus and the advanced age of donors. The longer it takes to become conscious of a sickness, the older one becomes, which eventually reveals more facts about Crimean-Congo Hemorrhagic Fever. The current study was supported by a different investigation that revealed a substantial relationship between contributors'

age and positive attitudes and best practices, supporting the earlier findings. The longer one has lived with an illness, the more familiar one becomes with it and the sooner one adopts healthier behaviors and attitudes. In the current study, the urban people exhibited better knowledge than the rural people. Most individuals in rural areas come into contact with cattle.

Most rural residents may be uninformed of CCHF since they haven't come across a sufferer in their area. Furthermore, a deficiency of knowledge and alertness amongst animal handlers is partly accountable for the quick development of CCHF. Nevertheless, the current study's regression analysis did not support the connotation between residency and knowledge. (Ahmed *et al.*, 2018).

Additionally, our study "demonstrates that, in comparison to the low-income populace, the population with high income has good knowledge." This is in line with several research studies that also showed that obtaining an advanced knowledge score is correlated with having an advanced socioeconomic status. One cannot overstate the impact that wealth or income has on one's health. Rich people will undoubtedly handle data and admit superior management, like schooling, as compared to impoverished people (Marmot 2002).

Conclusion and Recommendation

The findings reproduced inadequate levels of knowledge concerning CCHF among nurses that might be respected as less than predictable. As {CCHF} is an extremely transmittable disease, it's crucial to initiate a complete method to hold the condition earlier it blowouts additional further. Study results showed that it is vital to continuously assess all health care providers' knowledge, and also there is a need to improve the awareness by educated seminars, workshops about present endemic diseases to forthcoming health care providers.

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