Knowledge, Attitudes, and Perceptions toward Crimean-Congo Hemorrhagic Fever among a Sample of Physicians in Baghdad/ Al-Karkh 2024

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Abstract

Background: Crimean-Congo hemorrhagic fever (CCHF) is an acute tick-borne zoonotic viral disease that causes outbreaks in many regions of the Middle East, Europe, Asia, and Africa, with a high case fatality rate of 10%–40%. **Objective of the Study:** To determine the knowledge, attitude, and perceptions (KAP) among a sample of physicians toward CCHF infection in Baghdad/AL-Karkh health directorate and explore their association with sociodemographic data. **Subjects and Methods:** A descriptive cross-sectional study was conducted among 526 physicians from four hospitals and six primary healthcare centers in two districts related to the Baghdad/AL-Karkh health directorate from March to December/2024. Through a self-administered questionnaire covering demographic information, KAP of CCHF. **Results:** The study included 526 participants, with 53.2% having moderate-to-good knowledge, significantly associated with older age, prolonged experience, and working in primary healthcare centers. Good attitudes were observed in 60.1% of participants, particularly among females, family medicine specialists, older age groups, and those with longer experience. Perceptions were good in 49.8% of physicians, with significant associations with age being (18–25 years) and (50 years and above), female sex, and prolonged professional experience. **Conclusion:** More than half of the physicians exhibited moderate-to-good knowledge and positive attitudes, while nearly half of them had good perceptions. Targeted training programs and educational interventions are essential to enhance awareness and improve preparedness for CCHF outbreaks.

Keywords: Crimean-Congo, hemorrhagic fever, knowledge

INTRODUCTION

Crimean-Congo hemorrhagic fever (CCHF) is an acute zoonotic disease caused by a tick-borne virus (Nairovirus) belonging to the Bunyaviridae family. It is primarily transmitted by ticks of the *Hyalomaa* genus and is responsible for causing severe outbreaks of viral hemorrhagic fever, with a high case fatality rate ranging from 10% to 40%.^[1-4]

It was first identified in Crimea in 1944 and later linked to a similar strain discovered in Congo in 1969, leading to its current name.^[5,6]

CCHF is listed by the World Health Organization as a priority disease for research and development due to its high fatality rate, global prevalence, and the lack of an approved vaccine or effective treatment. This prioritization aims to address the urgent need for countermeasures in emergency health contexts.^[3,7]

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The virus has been reported in over 30 countries across Africa, Asia, southeast Europe, and the Middle East, including Iraq, with global annual incidence estimated at 10,000–15,000 cases, with a slow yet steady increase over recent years.^[5,8-10]

Iraq has experienced outbreaks since 1979, with a surge in cases after 2021, reaching 379 confirmed cases and 74 deaths by 2022.^[2,11-13]

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The main hosts of the CCHF virus are domestic livestock, for example, cattle, sheep, and goat. It occurs most often among butchers, slaughterhouse workers, and farmworkers. It is transmitted to humans mostly by the bites of infected Hyalomma ticks, or by exposure to the secretions and body fluids of the infected animals.^[8,10,14]

The virus can also spread from person to person through contact with body fluids, blood, or organs of the infected individual, and nosocomial infection may also occur through contact with contaminated medical equipment, improper sterilization, and the reuse of injection needles.^[15]

Early and accurate diagnosis of CCHF is crucial for improving patient outcomes and enabling timely implementation of response and control measures to prevent the further spread of the virus. Rapid identification helps initiate appropriate treatment, manage complications, and reduce transmission risks to healthcare workers and close contacts.^[8] To effectively counteract the impact of this dangerous disease, all regions, especially those highly affected, should implement preventive measures at all levels – primary, secondary, and tertiary – ensuring a comprehensive and coordinated approach to disease control and management.^[16]

Knowledge, attitude, and perception (KAP) studies play a crucial role in assessing existing awareness and training programs, ultimately guiding the development of more effective behavioral and preventive strategies.^[17]

Previous studies conducted in Pakistan, Iran, and Turkey have evaluated the KAP levels among students and healthcare professionals, highlighting the variations in awareness and preparedness across different regions. These studies have also emphasized the need to enhance knowledge and perceptions regarding hemorrhagic fever to improve early detection, strengthen infection control measures, and ensure better management of outbreaks.^[17-19]

Rationale of the study

CCHF is a serious public health threat in endemic regions, including Iraq. Physicians play a crucial role in its diagnosis, management, and prevention. However, gaps in KAP among healthcare providers may hinder effective disease control. Despite the growing concern over CCHF outbreaks, limited research has explored these aspects among physicians in Baghdad. This study aims to assess their KAP regarding CCHF, identify deficiencies, and provide insights for improving clinical training and public health interventions, ultimately enhancing preparedness and response to future outbreaks.

The objectives of the study

The objectives of this study were to assess the KAP about crimean–congo hemorrhagic virus infection among a sample of physicians in Baghdad/Al-Karkh province, and to find the association between some sociodemographic characteristics and the KAP of the physicians.

SUBJECTS AND METHODS Study design and setting

A descriptive cross-sectional study with analytical elements was conducted from March 1st to December 30th, 2024 among physicians working in the AL-Kadhymia and Al-Karkh districts, under the jurisdiction of the Baghdad/Al-Karkh Health Directorate. The data was collected from two hospitals and three primary healthcare centers (PHCC) from each district, selected conveniently, on average twice per week during official morning working hours.

Study population and sampling technique

The study targeted all physicians working in the emergency and consultation rooms of the selected healthcare institutions. The selection of participants was conducted using a convenient sampling technique, and then, they were categorized into four main groups based on their specialties (medical, surgical, family medicine and junior doctors).and we excluded the physicians who declined to participate.

Sampling size

The data collection continued throughout the designated period, resulting in a total of 570 questionnaires being collected. After excluding incomplete questionnaires, the final sample size included in the analysis was 526, representing the fully completed responses used in this study.

Study tool and data collection

The questionnaire was developed based on the Central Plan for Controlling Communicable Zoonotic Diseases for the Year 2024, authorized by the Iraqi Ministry of Health/Public Health Directorate, Center for Communicable Disease Control,^[20] and a KAP study conducted in Pakistan.^[17]

It was reviewed by a committee of experts working in the Communicable Disease Control Center and a group of physicians during the protocol presentation. After their evaluation, the questionnaire was formally approved for use in the study.

It is a self-administered questionnaire in the English language, consisting of four sections that cover the sociodemographics data, KAP.

The demographic section consists of sex, age, job title, the name of the institution, and experience years.

The knowledge section included 27 multiple-choice questions that covered topics such as a way of transmission, the causative agent, incubation period, symptoms, diagnosis methods, prevention, treatment, mortality rate, the most affected governorate, and the most affected months in Iraq. Responses were scored as follows: 1 point for correct answers and 0 points for incorrect answers or "no idea," with total scores ranging from 0 to 27. At the end of the knowledge section, participants were also asked if they had attended any workshop, lecture, or training event on CCHF in the past 3 years. The attitude section had six statements, and each item was recorded on a 5-point Likert scale (1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree).

Likewise, the perception portion had seven statements, each assessed on a 5-point Likert scale (1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree).

Bloom's cutoff points were used to categorize knowledge, attitudes, and perceptions. A score of 80%–100% was considered "good," while scores ranging from 60% to 79% were categorized as "moderate," and scores below 60% were categorized as "poor."^[21]

Statistical analysis

Data analysis was conducted using the Statistical Package for the Social Science (SPSS) version 26. The categorical data were presented as frequencies and percentages and the continuous data were presented as mean \pm standard deviation (SD). Chi-square tests were performed to compare the categorical variables. P < 0.05 were accepted as significant.

Ethical considerations

Data collection was started after obtaining official approval from the scientific medical committee of Al Nahrain College of Medicine, and the Iraqi Board of Medical Specialization.

An official letter of permission has been acquired from Al-Karakh Health Directorate addressing each selected sector of primary healthcare centers and hospitals.

Participation in the study was optional, and verbal consent was obtained from all participants. Data will be used for this research, and all personal information will be kept confidential.

RESULTS

The total number of participants was 526; the most frequent age group was 26-33 years with 340 (64.6%) participants, regarding sex, 318 (60.5%) were female. There were 64 (12.2%) family physicians, 195 (37%) medical specialties, 193 (36.7%) surgical specialties, and 74 (14.1%) junior doctors. There were 168 (31.9%) with 4–6 years of experience, as shown in Table 1.

The responses of participants regarding their knowledge about CCHF infection are shown in Table 2. Where 86.7% of participants correctly identified the causing factor of CCHF, 85.0% understood that contact with an infected vector could be a mode of transmission, and 93.2% correctly identified that contact with infected human blood and body fluids is a transmission source.

Regarding treatment options, only 20.2% correctly stated that CCHF cannot be entirely cured with medicine, only 31.7% knew that avoiding mosquito bites does not prevent CCHF, and 37.5% were aware that ribavirin is taken orally.

The study found that 280 (53.23%) of physicians had moderate-to-good knowledge regarding CCHF, as shown in Figure 1.

There was a statistically significant association between age group and knowledge levels, the mean knowledge score was better in older age groups, and the participants who practiced in PHCC had significantly higher knowledge than those who practiced in hospitals, as 31 (81.6%) of PHCC physicians had moderate-to-good knowledge while 249 (51%) of hospital physicians had the same knowledge. Experience had a significant impact on knowledge mean scores and levels, as participants with ≥ 10 years of experience had higher mean scores and good knowledge levels, as shown in Table 3.

There 266 (50.6%) participants agreed that the effect of early diagnosis positively impacts CCHF treatment, and the most frequent age groups that agreed were 18–25 years and \geq 50 years (P = 0.044), also females agreed more than males. Two hundred sixty (49.4%) agreed and 173 (32.9%) strongly agreed that the health care system should be

Table 1: Basic characteristics of participants									
Variables	Category	n (%)							
Age groups (years)	18–25	23 (4.4)							
	26–33	340 (64.6)							
	34-41	100 (19.0)							
	42–49	47 (8.9)							
	50 and above	16 (3.0)							
Sex	Male	208 (39.5)							
	Female	318 (60.5)							
Practicing place	PHCC	38 (7.2)							
	Hospital	488 (92.8)							
Specialties	Family medicine	64 (12.2)							
	Medical	195 (37)							
	Surgical	193 (36.7)							
	Junior doctors	74 (14.1)							
Experience (years)	0–3	126 (24.0)							
	4–6	168 (31.9)							
	7–9	105 (20.0)							
	10 and above	127 (24.1)							
PHCC: Primary health ca	re center								



Figure 1: Participants' knowledge level about Crimean-Congo hemorrhagic fever

Table 2: Distribution	of p	participants	according	to	answers	to	knowledge	questions
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Questions	Incorrect, <i>n</i> (%)	Correct, <i>n</i> (%)
1. The causing factor of CCHF	70 (13.3)	456 (86.7)
2. The spread of CCHF occurs through	291 (55.3)	235 (44.7)
3. Contact with an infected vector can be a mode of transmission to a human	79 (15.0)	447 (85.0)
4. Contact with infected human blood and body fluids can also be a transmission source	36 (6.8)	490 (93.2)
5. Contact with animals cannot transfer CCHF	64 (12.2)	462 (87.8)
6. Most affected governorates of Iraq	219 (41.6)	307 (58.4)
7. Most affected months of the year	373 (70.9)	153 (29.1)
8. CCHF transmitted through percutaneous contact	206 (39.2)	320 (60.8)
9. The most common cause of hospital-born Congo infection	130 (24.7)	396 (75.3)
10. The incubation period of CCHF	133 (25.3)	393 (74.7)
11. Predominant symptoms associated with CCHF	147 (27.9)	379 (72.1)
12. CCHF is highly symptomatic in infected animals	305 (58.0)	221 (42.0)
13. The mortality rate of CCHF in the world	267 (50.8)	259 (49.2)
14. The diagnostic option (s) that are available for CCHF	332 (63.1)	194 (36.9)
15. Standard treatment option available for CCHF	186 (35.4)	340 (64.6)
16. Best prophylactic measure (s) against CCHF	88 (16.7)	438 (83.3)
17. CCHF is a zoonotic disease	101 (19.2)	425 (80.8)
18. CCHF can be transmitted via air and water	168 (31.9)	358 (68.1)
19. CCHF transferred through social contacts like sharing clothes, cups/plates/spoons/glass, bathrooms, shaking hands and kissing	321 (61.0)	205 (39.0)
20. CCHF cured entirely with medicine	420 (79.8)	106 (20.2)
21. Contact with feces, urine, and saliva of an infected person can cause CCHF	166 (31.6)	360 (68.4)
22. Avoiding mosquito bites prevent CCHF	359 (68.3)	167 (31.7)
23. Is ribavirin taken orally?	197 (37.5)	329 (62.5)
24. The loading dose of ribavirin taken for CCHF is	432 (82.1)	94 (17.9)
25. Vaccine availability for CCHF	199 (37.8)	327 (62.2)
26. The suspected case of CCHF	120 (22.8)	406 (77.2)
27. Public health advice should focus on reducing the risk of transmission	77 (14.6)	449 (85.4)
28. Received any workshops or lecture or training events about CCHF during the past 3 years	463 (88.0)	63 (12.0)

CCHF: Crimean-Congo hemorrhagic fever

Table 3: Knowledge mean scores and levels of study participants

Variables	Category		Knowledg	e level	Р
		$Mean \pm SD$	Poor (<i>n</i> =246; 46.8%), <i>n</i> (%)	Moderate to good (n=280; 53.2%), n (%)	
Age groups	18–25	48.3±15	17 (73.9)	6 (26.1)	< 0.001
(years)	26–33	58.9±12.1	170 (50)	170 (50)	
	34-41	60.7±14.2	45 (45)	55 (55)	
	42-49	66.5±13.7	10 (21.3)	37 (78.7)	
	50 and above	63.2±14.5	4 (25)	12 (75)	
Sex	Male	59.5±14	92 (44.2)	116 (55.8)	0.346
	Female	59.7±12.7	154 (48.4)	164 (51.6)	
Practicing	PHCC	67.7±12.2	7 (18.4)	31 (81.6)	< 0.001
place	Hospital	59±13.1	239 (49)	249 (51)	
Specialties	Family medicine	59.8±14.5	28 (43.75)	36 (56.25)	0.382
	Medical	60.7±12.3	83 (42.6)	112 (57.4)	
	Surgical	58.2±13.1	99 (51.3)	94 (48.7)	
	Junior doctors	54.7±13.2	36 (48.6)	38 (51.4)	
Experience	0–3	56.8±13.3	71 (56.3)	55 (43.7)	< 0.001
(years)	4-6	58.9±11.5	84 (50)	84 (50)	
	7–9	58.1±13.6	54 (51.4)	51 (48.6)	
	10 and above	64.5±13.8	37 (29.1)	90 (70.9)	

PHCC: Primary health care center

adequately equipped to deal with isolated body fluids and testing for CCHF, and this was associated with longer

experience (P = 0.018). One hundred and seventy (32.3%) greed and 306 (58.2%) strongly agree that CCHF patients

should have isolated rooms, and this was significantly associated with specialties, as family medicine and medical specialties agreed more with this approach than surgical specialties (P < 0.001) [Table 4].

A good attitude toward CCHF was observed in 316 (60.07%) of participants, as shown in Figure 2.

The findings of the current study showed a significant association between good attitude and female physicians, specialization in family medicine, older age, and longer professional experience, as shown in Table 5.

There were 246 (46.8%) participants who agreed that there should be standard blood testing procedures for minimizing the risk of acquiring infection, and it was associated with older age groups (P=0.041). Two hundred fifty (47.5%) participants agreed and 174 (33.1%) strongly agreed with having isolation observing skills, and this was associated with female sex (P = 0.037) and medical/surgical specialties (P = 0.016). Only 200 (38%) agreed that using preventive medicines is important, and this was significantly associated with older age groups (P = 0.020), family medicine specialty (P = 0.033), and having more years of experience (P = 0.002). as shown in Table 6.

The participants' perceptions about CCHF were good among 262 (49.8%), as shown in Figure 3.

The good perceptions were significantly associated with specific sociodemographic factors, including age (18–25 years) and (50 years and above), female physicians, and longer experience durations, as illustrated in Table 7.

DISCUSSION

CCHF is a major public health concern in Iraq, with significant social, economic, and health-related impacts.^[22] Conducting a KAP study among physicians regarding CCHF can offer valuable insights into their level of awareness, attitudes toward the disease, and adherence to recommended safety protocols.

Knowledge, attitude, and perceptions level of the participants toward Crimean Congo hemorrhagic fever infection

The study revealed that about half of physicians had good-to-moderate knowledge, while nearly three-quarters of medical students in the Mosul study had good knowledge of CCHF.^[23] This may be attributed to the extensive scope of our questionnaire, which covered a broader range of topics and utilized a different scoring system. In addition, medical students tend to focus more on theoretical knowledge for examination, whereas practicing doctors balance both theoretical and practical aspects in clinical settings. While in the Pakistan study, about half of healthcare professionals reported having good knowledge, the higher level in the Pakistan study may be due to frequent CCHF outbreaks, including nosocomial outbreaks that lead to increased awareness among healthcare workers. Moreover, the variation in findings could also result from different populations and the use of different scoring systems.^[17]

Table 4: Attitude of participants to	wards Crim	ean-Congo he	emorrhagic fe	ever and asso	ciation with o	other study vari	ables			
Variables			Answers					٩		
	SD	Disagree	Neutral	Agree	SA	Age groups (years)	Sex	Practicing place	Specialties	Experience (years)
1. Effect of early diagnosis	21 (4)	34 (6.5)	100 (19)	266 (50.6)	105 (20)	0.044	<0.001	0.094	0.23	0.028
2. Severity of disease	16(3)	37 (7)	108 (20.5)	289 (54.9)	76 (14.4)	0.376	0.928	0.496	0.582	0.493
3. Risk of getting the infection	12 (2.3)	27 (5.1)	105 (20)	259 (49.2)	123 (23.4)	0.212	0.052	0.604	0.408	0.077
4. Concern dealing with infected persons	7 (1.3)	35 (6.7)	128 (24.3)	253 (48.1)	103 (19.6)	0.151	0.278	0.798	0.075	0.087
5. Dealing with infected body fluids	10(1.9)	10(1.9)	73 (13.9)	260 (49.4)	173 (32.9)	0.850	0.544	0.906	0.482	0.018
6. Room separation	5 (1)	16(3)	29 (5.5)	170 (32.3)	306 (58.2)	0.291	0.348	0.115	< 0.001	0.273
SD: Strongly disagree, SA: Strongly agree										

Variables		Attitude level		Total	Р	
	Good (<i>n</i> =316; 60.07%), <i>n</i> (%)	Moderate (<i>n</i> =182; 34.6%), <i>n</i> (%)	Poor (<i>n</i> =28; 5.32%), <i>n</i> (%)			
Age groups (years)						
18–25	13 (56.52)	10 (43.48)	0	23	< 0.001	
26–33	200 (58.88)	121 (35.58)	19 (5.59)	340		
34-41	61 (61)	31 (31)	8 (8)	100		
42–49	29 (61.7)	17 (36.17)	1 (2.13)	47		
50 and above	13 (81.25)	3 (18.75)	0	16		
Sex						
Male	112 (53.84)	80 (38.46)	16 (7.69)	208	< 0.001	
Female	204 (64.1)	102 (32.07)	12 (3.77)	318		
Practicing place						
PHC	24 (63.15)	13 (34.2)	1 (2.63)	38	0.751	
Hospital	292 (59.83)	169 (34.63)	27 (5.53)	488		
Specialties						
Family medicine	41 (64.06)	22 (34.38)	1 (1.56)	64	< 0.001	
Medical	116 (59.49)	70 (35.9)	9 (4.62)	195		
Surgical	116 (60.1)	59 (30.57)	18 (9.33)	193		
Junior doctors	43 (58.73)	31 (41.89)	0	74		
Experience (years)						
0–3	74 (58.73)	49 (38.89)	3 (2.38)	126	< 0.001	
4-6	102 (60.7)	53 (31.55)	13 (7.73)	168		
7–9	62 (59.04)	36 (34.29)	7 (6.66)	105		
10 and above	79 (62.2)	43 (33.86)	5 (3.94)	127		

Table 5: Distribution of	f sociodemographic	data of	participants	regarding	their	attitude	level	about	Crimean-0	Congo
hemorrhagic fever										

PHC: Primary health care



Figure 2: Participants' attitude toward Crimean-Congo hemorrhagic fever

In our study, More than half of the participants exhibited a good attitude toward CCHF. In contrast, in a study conducted in Pakistan, more than three-quarters of participants showed a positive attitude.^[17] This difference could be attributed to variations in study populations. Specifically, their study populations primarily consisted of healthcare workers from infectious disease and emergency departments, who are more frequently exposed to such infections and are thus expected to demonstrate higher levels of awareness and positive attitudes. Conversely, our study included a broader range of



Figure 3: Participants' perceptions regarding Crimean-Congo hemorrhagic fever

physicians from diverse specialties, including noninfectious disease fields.

Approximately half of the physicians in the current study demonstrated good perceptions, whereas more than two-thirds of participants in Pakistan studies exhibited positive perceptions.^[17,24] This discrepancy may be attributed to the frequent CCHF outbreaks in Pakistan, the implementation of targeted training programs focused on CCHF, differences in study populations, or the use of varying scoring systems to assess perceptions.

Experience (years) 0.199 0.002 0.103 0.217 0.244 0.022 0.248 Specialties 0.320 0.016 0.3010.055 0.033 0.581 0.033 Practicing ٩. place 0.4880.1890.991 0.978 0.595 0.435 0.171 0.714 0.008 0.3640.037 0.4060.431 0.031 Sex Table 6: Perceptions of participants towards Crimean-Congo hemorrhagic fever and association with other study variables Age groups (years) 0.041 0.0890.020 0.6860.353 0.548 0.174 74 (33.1) 41 (26.8) 45 (27.6) 155 (29.5) 60 (30.4) 102 (19.4) 60 (11.4) SA 246 (46.8) 250 (47.5) 262 (49.8) 266 (50.6) 216 (41.1) 239 (45.4) 200 (38) Agree Answers 112 (21.3) 08 (20.5) 73 (13.9) 55 (29.5) 103 (19.6) 89 (16.9) 74 (14.1) Neutral CCHF: Crimean-Congo hemorrhagic fever, SD: Strongly disagree, SA: Strongly agree Disagree 61 (11.6) 25 (4.8) 88 (16.7) 18 (3.4) 49 (9.3) 17 (3.2) 21 (4) 11 (2.1) 7 (1.3) 1 (2.1) 17 (3.2) 6(1.1) 16(3)5(1) SD 7. Animals herders are at a higher risk of CCHF infection 1. Standard blood testing procedures for minimizing the 5. Healthcare workers should undergo CCHF testing 4. You should have a valuable source of information 6. Pets can put you at additional risk for CCHF 3. Using preventive medicines is important 2. Having isolation observing skills risk of acquiring infection Variables

Association of demographic data with knowledge, attitude, and perception about Crimean–Congo hemorrhagic fever infection

In the context of our research, there was a significant relation between level of knowledge and age, experience, and workplace, with increased knowledge correlating with advanced age and prolonged professional experience. This finding is consistent with studies conducted in Turkey and Pakistan.^[17,18,25]

The study also revealed that physicians working in PHCCs demonstrated higher awareness levels (81.6%) compared to hospital-based physicians (51%). This may be attributed to PHCC physicians' greater involvement in community health and preventive care, which often exposes them to training on zoonotic diseases like CCHF. In contrast, hospital-based physicians typically focus on acute care and specialized treatments, with less emphasis on public health and preventive strategies. These findings differ from the Pakistan study, where participants working in tertiary care settings had higher knowledge levels, and they did not include primary healthcare workers in their sample.^[17]

In terms of attitude, there was a significant association between a good attitude and the characteristics of being female physicians, specializing in family medicine, exhibiting older age, and possessing extensive professional experience. Regarding the perceptions, it was also observed that individuals aged 18–25 and those aged 50 and above, along with females possessing greater experience, exhibited more positive perceptions. Research conducted in Pakistan and Turkey indicated that advanced age, extended professional experience, and elevated levels of education were linked to a more positive attitude.^[17,18,25] These findings suggest that factors such as gender, age, and experience play important role in shaping attitudes within the medical profession, highlighting the need for tailored interventions to foster positive perceptions among diverse groups.

CONCLUSIONS

Over half of the participants demonstrated moderate-to-good knowledge and attitudes, while nearly half had good perceptions regarding CCHF. Higher knowledge levels were observed among older, more experienced physicians, especially those working in primary healthcare centers. A positive attitude was more common among older physicians, female doctors, and family medicine specialists. Good perceptions were significantly linked to specific sociodemographic factors, including younger (18–25 years) and older (50 + years) age groups, female physicians, and those with longer experience.

Recommendations

To enhance the knowledge, attitude, and perception of doctors toward CCHF, it is advisable to institute mandatory CCHF training programs for physicians, either through accredited centers or as part of postgraduate medical curricula, establish

Variables	Perceptions level									
	Good (<i>n</i> =262; 49.8%), <i>n</i> (%)	Moderate (<i>n</i> =226; 42.96%), <i>n</i> (%)	Poor (<i>n</i> =38; 7.222%), <i>n</i> (%)							
Age groups (years)										
18–25	13 (56.52)	10 (43.48)	0	23	< 0.001					
26–33	169 (49.71)	148 (43.53)	23 (6.76)	340						
34-41	50 (50)	37 (37)	13 (13)	100						
42–49	21 (44.68)	24 (51.06)	2 (4.26)	47						
50 and above	9 (56.25)	7 (43.75)	0	16						
Sex										
Female	168 (52.83)	173 (54.4)	13 (4.09)	318	< 0.001					
Male	94 (45.19)	89 (42.79)	25 (12.02)	208						
Practicing place										
PHC	14 (36.84)	21 (55.26)	3 (7.89)	38	0.376					
Hospital	248 (50.82)	205 (42.01)	35 (7.17)	488						
Specialties										
Family medicine	31 (48.44)	32 (50.0)	1 (1.56)	64	0.543					
Medical	96 (49.23)	86 (44.10)	13 (6.67)	195						
Surgical	103 (53.37)	68 (35.23)	22 (11.4)	193						
Junior doctors	32 (43.24)	40 (54.05)	2 (2.7)	74						
Experience (years)										
0–3	56 (44.44)	56 (44.44)	14 (11.11)	126	< 0.001					
4-6	85 (50.59)	69 (41.07	14 (8.3)	168						
7–9	54 (51.42)	44 (41.9)	7 (6.6)	105						
10 and above	67 (52.75)	57 (44.88)	3 (2.36)	127						

Table	7:	Distribution	of	sociodemographic	data	Of	participants	regarding	their	perceptions	of	Crimean-Congo	hemorrhagic
fever													

PHC: Primary health care

continuous education initiatives, including workshops and seminars, to enhance awareness of CCHF prevention and management. Also emphasize the importance of infection control measures, particularly proper use of PPE, and Ensure healthcare facilities are well-equipped with necessary isolation capabilities for effective disease containment.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- World Health Organization. Crimean-Congo Haemorrhagic Fever. United States: World Health Organization; 2013. Available from: https://www.who.int/news-room/fact-sheets/detail/crimean-congohaemorrhagic-fever. [Last accessed on 2024 Aug 25].
- Jafar U, Usman M, Ehsan M, Naveed A, Ayyan M, Cheema HA. The outbreak of Crimean-Congo hemorrhagic fever in Iraq – Challenges and way forward. Ann Med Surg (Lond) 2022;81:104382.
- 3. de la Fuente J, Ghosh S, Lempereur L, Garrison A, Sprong H, Lopez-Camacho C, *et al.* Interventions for the control of Crimean-Congo hemorrhagic fever and tick vectors. NPJ Vaccines 2024;9:181.
- Baghdadi GA, Aakef IR, AbdulRaheem Y. Upsurge of Crimean-Congo hemorrhagic fever during Eid-Al-Adha period 2023 in Iraq. Al Rafidain J Med Sci 2024;7:75-80. Available from: https://ajms.iq/index.php/ ALRAFIDAIN/article/view/1087. [Last accessed on 2025 Feb 14].
- Frank MG, Weaver G, Raabe V, State of the Clinical Science Working Group of the National Emerging Pathogens Training, Education Center's Special Pathogens Research Network2, State of the Clinical Science

Working Group of the National Emerging Pathogens Training Education Center's Special Pathogens Research Network. Crimean-Congo hemorrhagic fever virus for clinicians-epidemiology, clinical manifestations, and prevention. Emerg Infect Dis 2024;30:854-63.

- Al-Obaidi AB. Crimean-Congo hemorrhagic fever in the Middle East: History and facts. Iraqi JMS 2018;16:111-3.
- Kuehnert PA, Stefan CP, Badger CV, Ricks KM. Crimean-Congo hemorrhagic fever virus (CCHFV): A silent but widespread threat. Curr Trop Med Rep 2021;8:141-7.
- Factsheet about Crimean-Congo Haemorrhagic Fever. European Centre for Disease Prevention and Control; 2022. Available from: https:// www.ecdc.europa.eu/en/crimean-congo-haemorrhagicfever/facts/ factsheet. [Last accessed on 2024 Sep 02].
- Baghdadi GA, Aakef IR, Mahdi SG, Khaleel RI. Crimean-Congo haemorrhagic fever in Iraq. East Mediterr Health J 2024;30:570-6.
- Hawman DW, Feldmann H. Crimean-Congo haemorrhagic fever virus. Nat Rev Microbiol 2023;21:463-77.
- Atwan Z, Alhilfi R, Mousa AK, Rawaf S, Torre JD, Hashim AR, et al. Alarming update on incidence of Crimean-Congo hemorrhagic fever in Iraq in 2023. IJID Reg 2024;10:75-9.
- Al-Yabis AS, Ammer A, Hasony HJ. Seroepidemiology of Crimean-Congo haemorrhagic fever in rural community of Basrah. Med J Basrah Univ 2024;23:30-35. Available from: https://www.iasj.net/iasj/ article/46127. [Last accessed on 2024 Sep 30].
- Alhilfi RA, Khaleel HA, Raheem BM, Mahdi SG, Tabche C, Rawaf S. Large outbreak of Crimean-Congo haemorrhagic fever in Iraq, 2022. IJID Reg 2023;6:76-9.
- Mustafa AH, Lami F, Khaleel HA. Epidemiological Profile of Crimean-Congo Hemorrhagic Fever, Iraq, 2018; 2023. Available from: https:// www.researchgate.net/publication/376054733_Epidemiological_Profile_ of_Crimean-Congo_Hemorrhagic_Fever_Iraq_2018. [Last accessed on 2025 Feb 01].
- 15. Okesanya OJ, Olatunji GD, Kokori E, Olaleke NO, Adigun OA, Manirambona E, et al. Looking beyond the lens of Crimean-Congo

hemorrhagic fever in Africa. Emerg Infect Dis 2024;30:1319-25.

- AbdulRaheem Y. Unveiling the Significance and challenges of integrating prevention levels in healthcare practice. J Prim Care Community Health 2023;14:21501319231186500.
- Ahmed A, Saqlain M, Tanveer M, Tahir AH, Ud-Din F, Shinwari MI, et al. Knowledge, attitude and perceptions about Crimean Congo haemorrhagic fever (CCHF) among occupationally high-risk healthcare professionals of Pakistan. BMC Infect Dis 2021;21:35.
- Yolcu S, Kader C, Kayipmaz AE, Ozbay S, Erbay A. Knowledge levels regarding Crimean-Congo hemorrhagic fever among emergency healthcare workers in an endemic region. J Clin Med Res 2014;6:197-204.
- Salimi M, Aghaei Afshar A, Limoee M, Babakhani S, Chatrabgoun O, Hanafi-Bojd AA, *et al.* Knowledge, attitude and practice of healthcare workers concerning Crimean-Congo hemorrhagic fever in Western Iran. Asian Pac J Trop Biomed 2016;6:546-50.
- Iraqi Ministry of Health/Public Health Directorate, Center for Communicable Disease Control. Central plan for Communicable Zoonotic Diseases Control 2024, Viral Diseases, Sheet of Crimean-Congo Hemorrhagic Fever; 2024. p. 47-54.

- Celentano DD, Szklo M, Gordis AC. Gordis Epidemiology. 6th ed. United States: Elsevier; 2018.
- Sabir DK, Mohammad SH, Khwarahm NR, Arif SK, Tawfeeq BA. Epidemiological study of the 2023 Crimean-Congo hemorrhagic fever outbreak in Iraq. IJID One Health 2024;2:100017.
- 23. Taqi F, Noori T, Shaker E. Knowledge level about Crimean-Congo hemorrhagic fever among a sample of medical students in Mosul City, Iraq. Rawal Med J 2023;48:614. Available from: https://www. researchgate.net/publication/373850355_Knowledge_level_about_ Crimean-Congo_hemorrhagic_fever_among_a_sample_of_medical_ students_in_Mosul_City_Iraq. [Last accessed on 2025 Feb 01].
- Ahmed A, Tanveer M, Saqlain M, Khan GM. Knowledge, perception and attitude about Crimean Congo hemorrhagic fever (CCHF) among medical and pharmacy students of Pakistan. BMC Public Health 2018;18:1333.
- 25. Cagdas SNA, Saglam ZA, Toprak D, Sargn F, Mutlu HH. Knowledge attitude and practice survey regarding Crimean Congo hemorrhagic fever among a sample of physicians in Turkey. Advances In Life Sciences And Health 2015:2:1-8.