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By Universitas Muhammadiyah Sidoarjo

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Knowledge of Crimean-Congo Hemorrhagic Fever among Nurses at Al-Nasiriyah City Hospitals in Iraq

Pengetahuan tentang Demam Berdarah Krimea-Kongo di antara Perawat di Rumah Sakit Kota Al-Nasiriyah di Irak

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Abstract

Background: CCHF caused by a tick-borne virus from the Bunyaviridae family, is a severe viral hemorrhagic fever with a mortality rate of 10–40%. **Specific Background:** Despite their critical role in treating and preventing CCHF, comprehensive research on CCHF transmission and knowledge among healthcare workers, especially nurses in Al-Nasiriyah, Iraq, is lacking. **Knowledge Gap:** Current literature lacks detailed studies on the awareness and preparedness of nurses regarding CCHF in high-risk areas. **Aims:** Aims to assess the knowledge of nurses concerning CCHF in Al-Nasiriyah's educational hospitals and identify gaps in their understanding to improve disease management and prevention strategies. **Results:** Utilizing a descriptive cross-sectional design, the study surveyed 500 nurses across five teaching hospitals. The average age of participants was 28.83 years, with a predominant proportion holding diplomas and obtaining information primarily from social media. The results revealed that nurses' knowledge about CCHF was suboptimal, with 69.4% of correct answers and a predominance of moderate knowledge levels. **Novelty:** This research provides novel insights into the knowledge deficits among nurses in an endemic region, highlighting the critical need for targeted educational interventions. **Implications:** The findings underscore the necessity for comprehensive educational courses on occupational safety and disease prevention tailored to healthcare workers in endemic areas, aiming to enhance their knowledge and preparedness against CCHF.

Highlights:

Knowledge Gaps: Nurses' CCHF understanding is inadequate.

Educational Need: Targeted training can improve disease management.

Information Sources: Social media use highlights need for reliable sources.

Keywords: Crimean-Congo hemorrhagic fever, nurses' knowledge, endemic regions, healthcare education, CCHF prevention

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Introduction

Crimean-Congo hemorrhagic fever (CCHF) is a prevalent illness caused by a tick-borne virus from the Bunyaviridae family known as Nairovirus, the CCHF virus leads to severe epidemics of viral hemorrhagic fever, resulting in a death rate ranging from (10% to 40%) (1). CCHF virus has spread to over (30) countries and is endemic throughout Africa, the Middle East, Eastern Europe, and Central Asia since its discovery, CCHF virus was recently identified in Spain and Southwest Europe, the sequencing research revealed a tight genetic relationship between them and CCHF virus isolates from West Coast of Africa, Mauritania, and Senegal, anatomical factors mostly contribute to CCHF outbreaks, either due to their high population numbers throughout the year or their increased attraction and aggression towards human blood (2). CCHF is a viral zoonotic disease that causes high fever and bleeding from multiple parts of the body, the virus is often spread by ticks to animal hosts through a sylvatic cycle, ticks are the biological vectors that transmit the CCHF and are termed its reservoirs (3).

The CCHF virus transmitted through contact with infected ticks or animal blood, such as livestock, it can also be spread among humans through contact with infectious blood or body fluids (4). Especially in healthcare settings, CCHF is classified as a nosocomial infection meaning it can be contracted by a patient in a hospital for a condition unrelated to the infection an acquired infection is one that develops in a patient after being admitted to a hospital or healthcare institution where the disease was not initially present or developing, that referred to diseases contracted in the hospital but manifesting after discharge and infections among the facility staff due to their work (5). CCHF can occur due to exposure to contaminated medical-surgical equipment, inadequate sanitation, and the reuse of injection needles (6). Understanding CCHF is crucial for enhancing infection control tactics and developing effective preventive and therapeutic methods to reduce the incidence and fatality rate (7).

Healthcare providers are susceptible to contracting numerous infectious diseases such as CCHF (8). They frequently encounter a variety of infections in the course of their employment (9). Nurses are crucial in treating and avoiding the increasing trend of disease as the main caregivers for hospitalized patients (10). Healthcare practitioners are at greater risk and are responsible for administering health treatments, they must possess expertise in diagnosing and managing patients. They must be properly taught, monitored, and equipped with sufficient resources to maintain credibility in the healthcare system (11). If frontline healthcare personnel are not supported physically, socially, financially, and psychologically, the global battle against the pandemic could result in significant consequences (12). Inadequate comprehension and awareness of the condition, particularly among at-risk populations, are significant factors contributing to the high incidence of the disease and subsequent fatalities (13). The study will be crucial for identifying important gaps in the literature about nurses' knowledge of CCHF, this will aid in developing suitable interventions to avoid future nosocomial transmission

Methods

Study Design

A descriptive cross-sectional design used to determine the knowledge of nurses towards Crimean-Congo Hemorrhagic Fever (CCHF) in the hospitals of Al-Nasiriyah city.

The Setting of the Study

The study was conducted in educational hospitals in the city of Al-Nasiriyah, which is divided geographically into two parts: the Al-Jazeera part and the Al-Shamiya part. In the Al-Jazeera part, there are three educational hospitals, namely (Al-Hussein Teaching Hospital, Al-Haboubi Teaching Hospital, and Muhammad Al-Moussawi Teaching Hospital). As for the Shamiya part, there are two hospitals: (Al-Nasiriyah Teaching Hospital and Bint Al-Huda Teaching Hospital).

Sample and Sampling

A non-probability convenience sample of (500) nurses from the teaching hospitals in Al- Nasiriyah city study participants were recruited from the teaching hospitals who work in (Isolation wards, Emergency Department, Intensive Care Unit (ICU), Consulting Department, and Operations Department), who working in Al-Nasiriyah teaching hospitals.

The Pilot Study

The pilot study was conducted on a sample of (15) nurses in the teaching hospitals. This sample was excluded from the original sample of the study, where (5) nurses were taken from Al-Nasiriyah Teaching Hospital, (3) nurses from Al-Hussein Teaching Hospital, (2) nurses were taken from Al-Haboubi Teaching Hospital, (4) nurses from Bint Al-Huda Teaching Hospital, and one nurse from Al-Musawi Hospital. The aims of a pilot study may also assist with identifying problems that may interfere with study validity or challenges in using the instruments and finding out the reliability of the study instrument that was used to collect the sample. The time that the study participants

needed to answer all items was (5-10) minutes. All items were clear for the study participants.

Ethical Considerations

After obtaining approval from the College of Nursing, University of Baghdad, to conduct the study. The details of the study were discussed with officials in the Dhi-Qar Health Department, and official approvals were taken and directed to the officials of the five teaching hospitals in the Al- Nasiriyah city, as well as all the hospital departments mentioned above and interviewed the participants and explained what the importance of this study was, also explain how to complete the questionnaire and that they could withdraw at any time. Participants were informed that their data would remain private and secure and they were assured that their identities would remain anonymous in the presentation, reports, or any final study publication.

Data Collection

Data were collected from nurses who working in teaching hospitals, with all qualifications , both male and female nurses, Nurses who work in morning and night shifts , excluding the nurses who were selected in the pilot study and who had training courses .The adapted questionnaire was then distributed to nurses who work in the (Isolation wards, Emergency Department, Intensive Care Unit (ICU), Consulting Department, and Operations Department).It was collected and received by the head of each department. The period from January 4th, 2024, to January 30th, 2024.

The Study Instrument

The study instrument was a adapted a validated questionnaire after taking the permission from the original author and made citation to his article in the study (11). The final version of the tool consisted of two parts for the assessment of demographics and knowledge, The demographic section comprised (sex, age, years of service at work, nurses' qualification, and the major source of information. The knowledge section included 19 questions and assessed by giving a score of (1) to the wrong answer and (2) to correct answer. The knowledge section included 19 questions. and assessed by giving a score of (2) to the total correct answer for each participant and (1) to the wrong total answers for each participant. If nurses correctly answer (10 -19) questions from the total (19) questions, he/she regarded as having knowledge that divided into levels (10-11poor), (12-13modrate), (14-15 good), (16-17 very good) and (18-19 excellent). The Knowledge demonstrated excellent internal consistency reliability (Cronbach's alpha = 0.913).

Statistical Analysis

The statistical package for the social sciences (SPSS) by (IBM), version (27), was used for data analysis, in order to characterize the sociodemographic features of the research participants, the descriptive statistical measures of frequency, percentage, the standard deviation, and mathematical mean were utilized, and (Chi-Squar) were used to examine differences in the dependent variable (Knowledge), while the independent variable involved (CCHF). significant value = 0.05

Result and Discussion

Result

| SDVs | Classification | Freq. | % |
|-------------------|--------------------|-------|--------------|
| Age/years | 20-30 years | 364 | 72.8 |
| | 30-40 years | 95 | 19.0 |
| | 40-50 years | 39 | 7.8 |
| | 50-60 years | 2 | 0.4 |
| | Total | 500 | 100.0 |
| | Ms. ±S.D. | | 28.83± 5.957 |
| Sex | Male | 182 | 36.4 |
| | Female | 318 | 63.6 |
| | Total | 500 | 100.0 |
| Years of Services | More than 10 years | 109 | 21.8 |
| | From 7-9 years | 95 | 19.0 |
| | From 4-6 years | 147 | 29.4 |
| | From 1-3 years | 99 | 19.8 |
| | Less than year | 50 | 10.0 |

| | | | |
|---|-------------------------------------|-----|-------|
| | Total | 500 | 100.0 |
| nurses' qualification | Pre-graduate (Nursing, Midwife) | 127 | 25.4 |
| | Diploma | 223 | 44.6 |
| | Bachelor | 141 | 28.2 |
| | Master | 9 | 1.8 |
| | Total | 500 | 100.0 |
| You have information about CCHF? | Yes | 500 | 100.0 |
| | No | 0 | 0.0 |
| | Total | 500 | 100.0 |
| If yes, what is your source of information? | Continues Education in the hospital | 114 | 22.8 |
| | Academic Education | 104 | 20.8 |
| | Workshop | 32 | 6.4 |
| | Social media | 217 | 43.4 |
| | Media | 33 | 6.6 |
| | Total | 500 | 100.0 |

Table 1. Distribution of Nurses by Socio-Demographic Variables

F=Frequency, %= Percent, Arithmetic Mean and Std. Dev. (S.D.).

(Table 1) shows that all nurses, 500 (100%) with an average age of (28.83 \pm 5.957) years old (72.8%) of them their age)20-30(years old,)364(within the total mean and standard deviation. most of them were females (n= 318; 63.6%) compared to males (n = 182; 36.4%), most of them had years of service from (4-6) years (n =147;29.4%), the highest percentage held diploma, (n= 223; 44.6%), the highest percentage were getting their source of information from the social media, (n = 217;43.4%).

| No . | Questions about Knowledge | Correct Answer | Incorrect Answer |
|------|---|----------------|------------------|
| 1 | The causing factor of CCHF | 381 (76.2%) | 119 (23.8%) |
| 2 | The spread of CCHF occurs through (mosquitos, ticks, flies) | 387 (77.4%) | 113 (22.6%) |
| 3 | Contact with an infected vector is the mode of Transmission to humans. | 319 (63.8%) | 181 (36.2%) |
| 4 | Contact with infected human blood and body fluids is the source of transmission. | 376 (75.2%) | 124 (24.8%) |
| 5 | Contact with animals cannot transfer CCHF | 353 (70.6%) | 147 (29.4%) |
| 6 | CCHF is transmitted through percutaneous contact | 204 (40.8%) | 296 (59.2%) |
| 7 | The use of unsterilized medical equipment is one of the most common causes of CCHF in hospitals | 384 (76.8%) | 116 (23.2%) |
| 8 | The most common cause of CCHF in the hospital are poor infection control | 368 (73.6%) | 132 (26.4%) |
| 9 | The predominant symptoms associated with CCHF are: | 208 (41.6%) | 292 (58.4%) |
| 10 | CCHF is highly symptomatic in infected animals. | 87 (17.4%) | 413 (82.6%) |
| 11 | Select the best prophylactic measure(s) against CCHF | 293 (58.6%) | 207 (41.4%) |

| | among the following? | | |
|-------|---|-------------|-------------|
| 12 | CCHF is a zoonotic disease | 384 (76.8%) | 116 (23.2%) |
| 13 | CCHF is transmitted through the air | 294 (58.8%) | 206 (41.2%) |
| 14 | CCHF is transmitted through the water | 373 (74.6%) | 127 (25.4%) |
| 15 | CCHF is transferred through social contacts like sharing clothes, Cups/plates/spoons/ glass, bathrooms, shaking hands & kissing | 305 (61%) | 195 (39%) |
| 16 | CCHF is completely cured with medicine. | 339 (76.8%) | 161 (23.2%) |
| 17 | Contact with feces, urine, and saliva of an infected person can cause CCHF | 387 (77.4%) | 113 (22.6%) |
| 18 | Does avoiding mosquito bites prevent CCHF? | 96 (19.2%) | 404 (80.8%) |
| 19 | Is there any vaccine available for CCHF? | 395 (79%) | 105 (21%) |
| Total | | 312 (62.4%) | 188 (37.6%) |

Table 2. Nurses' Knowledge About Crimean-Congo Hemorrhagic Fever (CCHF)

The results showed regarding to nurses' knowledge about Crimean-Congo hemorrhagic fever disease according to their answers that were (15) questions from (19) one, they answered them correctly while only (4) questions were un correct answers that were (6,9,10,18) questions .Also the study showed that the number of nurses whose their total correct answers from the total question in the table which were (19) question was (n=347,69,4%) that were divided to five categories according to their level of answers, the results appeared that the group who answered (10 - 11)correct answers were poor (n=95 ,27%), while most of nurses whose total answered (12 - 13) correct answers were moderate (n=127 ,37%), but the group who their correct answers (14 - 15) questions were good (n=73 ,21%), while the group that their correct answers (16 - 17) were very were good (n= 43 ,12 %), and the group who answered(18 - 19) questions were excellent (n= 9 , 3%) (Figure -1).

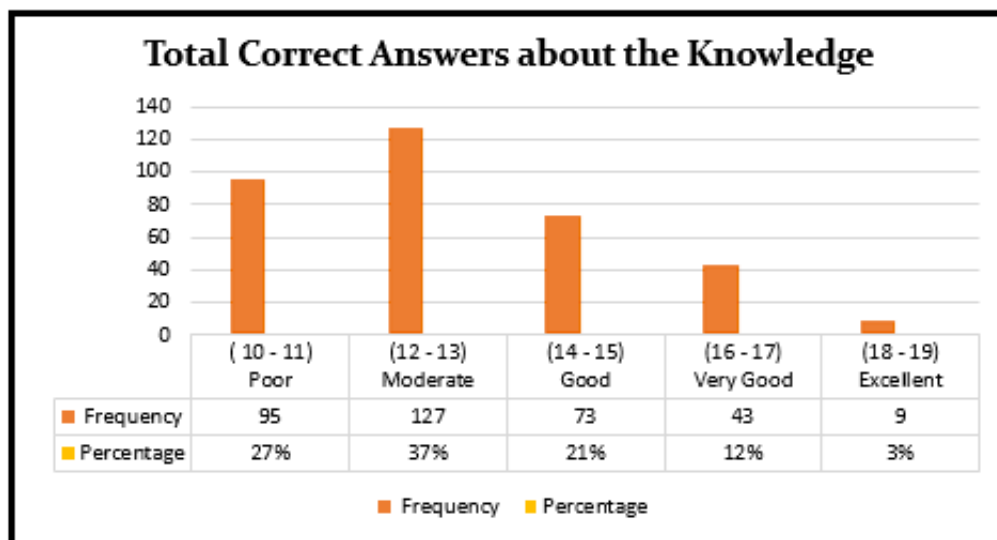


Figure 1. Showed the total correct answers for nurses towards their knowledges about CCHF.

There was no significant differences association between nurses' knowledge toward CCHF with their socio-demographic variables regard to Nurses' (sex, Age, and Years of Service) (p=0.080, p=0.064, p=0.116) respectively, but there were significant differences association between nurses' knowledge toward CCHF with their socio-demographic variables regarding to the nurses' qualification and source of information nurses' (p=0.037, p=0.043), (Table -3).

| Socio-Demographic Variables | | Good Knowledge | Poor Knowledge | Sig. |
|-------------------------------------|-------------------------------------|----------------|----------------|-----------|
| Sex | Female | 116 (36.5%) | 202 (63.5%) | 0.080 N.S |
| | Male | 57 (31.3%) | 125 (68.7%) | |
| Age | 20-30 years | 135 (35.8%) | 242 (64.2%) | 0.064 N.S |
| | 31-40 years | 27 (32.5%) | 56 (67.5%) | |
| | 41-50 years | 10 (34.5%) | 19 (65.5%) | |
| | 51-60 years | 1 (50%) | 1 (50%) | |
| nurses' qualification | Pre-graduate (Nursing, Midwife) | 42 (33.1%) | 85 (66.9%) | 0.037 S |
| | Diploma | 77 (34.5%) | 146 (65.5%) | |
| | Bachelor | 51 (36.2%) | 90 (63.8%) | |
| | Master | 3 (33.3%) | 6 (66.7%) | |
| Years of Service | More than 10 years | 28 (25.7%) | 81 (74.3%) | 0.116 N.S |
| | From 7-9 years | 34 (35.8%) | 61 (64.2%) | |
| | From 4-6 years | 55 (37.4%) | 92 (62.6%) | |
| | From 1-3 years | 37 (37.4%) | 62 (62.6%) | |
| | Less than year | 19 (38%) | 31 (62%) | |
| What is your source of information? | Continues Education in the hospital | 61 (33.9%) | 119 (66.1%) | 0.043 S |
| | Academic Education | 38 (34.9%) | 71 (65.1%) | |
| | Workshop | 10 (29.4%) | 24 (70.6%) | |
| | Social media | 54 (38.1%) | 88 (61.9%) | |
| | Media | 10 (28.6%) | 25 (71.4%) | |

Table 3. Association between Nurses' Knowledge of Crimean-Congo Hemorrhagic Fever with their Socio-Demographic Variables

N.S: Non-Significant, S: Significant, Significant p-value < 0.05.

Discussion

A. Distribution of Nurses by Socio-Demographic Variables

The study revealed that the largest age group of nurses involved in the research was between (20 - 30) years old, that included (n=364,72.8%) from a sample size of (500) nurses. The increase in age group could be related to the rising number of newly employed nurses in Al-Nasiriyah's hospitals. A study conducted in Turkey found that nurses aged (19-45) had the highest degree of knowledge regarding CCHF, with an average of (29.6 ± 6.5) from a sample size of (109) (14). As well as the study agreed with a study conducted in Pakistan which found that the greatest age group was (26-33) years old, with (n=172 ,36%) from a sample size of (478) (11).

The study revealed that (n=318,63.6%) of female nurses and (n= 182,36.4%) male nurses participated. Imbalance may be attributed to the higher representation of female nurses in the hospitals where the samples were collected. The study's findings align with those of comparable research carried out in Pakistan and Turkey. In Pakistan, the study results indicated that the higher percentage were girls as well as in Turkey, a study results indicated that there were girls higher than (14).

The results showed that nurses whose service lasted from (4-6) years amounted to (n=147,9.29%), which was the greatest percentage. The result of the study supported with a study conducted in Turkey, that revealed that the years of employment for nurses were (1-5) years, was higher than the others (14).as well as with a study in Pakistan showed that the number of years of service is (4-6) years, was the greatest percentage (11) .

The study found that the most of nurses who participating in the study held a diploma (n=223, 44.6%). The result may be attributed to the high percentage of nurses who had diploma in the hospitals where the samples were collected, as well as it could be due to lack of graduates with advanced degrees and bachelor's degrees in the region.

The result agreed with a study held in Iran showed lower knowledge scores (P=0.047). between health care workers including nurses, there was a need to establish professional education campaigns in highly endemic deprived areas and encourage nurses' use of academic materials and increase the knowledge of less-educated HCWs (15). The study found that all participating nurses were knowledgeable about CCHF, regardless of the accuracy of their information, but in a study conducted in Turkey healthcare workers surveyed considered their

knowledge about CCHF was adequate (14). The results showed the highest percentage in the study sample, amounting to (n=217,43.4%). that their source of information about CCHF for the nurses who participated in the study was social networking sites.

The media played an effective role in focusing on the causes, transmission methods, signs, and symptoms of CCHF through social networking sites to educate people on prevention due to the high increase in infection and mortality rates in Iraq regardless to the accuracy and abundance of the information. The result was agreed by research conducted in Pakistan, which revealed that higher percentage of the study participants had source of information from social networking sites (11). But Research in Turkey found that the percentage of continuing education in hospitals was higher than those on social networking sites (14).

B.Nurses' Knowledge About Crimean-Congo Hemorrhagic Fever (CCHF)

Nurses' knowledge towered CCHF disease, they provided (n= 381, 76%) response rate for the causal agent for hemorrhagic fever disease, from a total of participants. in research conducted in Turkey, when (99%) of nurses recognized the virus as the primary cause of CCHF. In Pakistan, a study on nurses' knowledge regarding Crimean-Congo Hemorrhagic Fever (CCHF) found that (93.9%) correctly identified it as a viral disease, among (478) healthcare professionals surveyed, (n=350,73.2%) correctly identified the virus as the causative agent of CCHF (11). The results of the study showed that the correct answer rate about the spread of CCHF, was (n=387,77.4%), which is the highest percentage. Spread occurs by ticks consistent with a study held in Pakistan correctly identified that coming into contact with infected Hyalomma ticks' results in the transmission of CCHF (11).

The study indicated that nurses who reported having contact with an infected vector as a mode of transmission to humans, which accounted for participants (n=319,63.8%), provided the correct answer. Another study focused on the importance of educating health professionals about ticks and TBDs post-graduation, as well as informing nursing students about emerging infectious diseases and arthropod vectors before their hospital training to safeguard both themselves and patients from vector-borne infectious diseases (16). Contact with infected human blood and body fluids as the source of transmission, the study showed that the nurses participating in the study, whose answers was yes, which (n=376,75.2%), was the correct answer. A study in Turkey found that (90.9%) believed transmission to nurses occurred through contact with patient blood and (88.8%) through body fluids (14). Contact with animals cannot transfer CCHF, the study showed that the nurses participating in the study, whose answer was no, which (n=353,70.6%) was the correct answer, However, a study's findings indicated that those at high risk in regions with high disease prevalence are those who had occupational exposure to livestock and other animals (14).

The study showed that the nurses participating in the study CCHF being transmitted through percutaneous contact, their answers was yes, which (n=204,40.8%) which was the correct answer. The result disagrees with a study conducted Iran regarding the knowledge and awareness of nurses about CCHF, their answer was higher (89.5%) of participants, also disagree with a study from Pakistan that confirmed this mode of transmission it is significant because the percutaneous route of nosocomial transmission has been identified as a potential route for CCHF transmission in a past outbreak in Rawalpindi, Pakistan (11).

The study showed that the most answers to use of unsterilized medical equipment is one of the most common causes of CCHF in hospitals, was yes, which (n=384,76.8%) which was the correct answer. A study in Pakistan showed that nurses are at high risk due to their close interaction with patients during procedures like administering IV lines and taking blood samples, which could lead to accidental needle stick injuries and nosocomial transmission (11). According to the Centers for Disease Control and Prevention (CDC), reusing injection needles, not properly sterilizing medical equipment, and contaminating medical supplies can all lead to the spread of community-acquired hospital infections (CCHF) (17). Strict sterilization procedures must be followed in hospitals to stop infections.

The study showed the most answers about the most common cause of CCHF in the hospital was poor infection control, was yes, which (n=368,73.6%) that were the correct answer. The spread of CCHF in healthcare settings can be due to inadequate infection control measures, including improper sterilization of medical equipment, reuse of injection needles, and contamination of medical supplies (11).

The study revealed that the answers about predominant symptoms associated with CCHF, whose answers were Hemorrhagic and fever (n=183, 36.6%), generalized red spots which (n=109,21.8%), and all above which (n=208,41.6%) Their answers regarding signs and symptoms of the disease were incorrect, which was the highest percentage (n=292,58.4%), While the correct answer was all of the above. The study conducted found that the earliest symptoms of CCHF, as reported by nurses and midwifery students, were fever (93.7%), headache (65.9%), acute fatigue/exhaustion (88.8%), and arthralgia-myalgia (68.6 %) (16).

The results of the study demonstrated that the nurses who answered whether or not CCHF is highly symptomatic in infected animals were incorrect in the largest percentage (n=350,70%), while the correct response was no. When the virus causes a natural infection, livestock like cattle, goats, and sheep might contract the CCHF virus; however, many of these animals and birds only exhibit minor or nonexistent symptoms (18). Humans are the main victims of the disease, which can be spread by tick bites or coming into touch with contaminated animal blood. The study

showed that the nurses in the study whose answers were all the above (n=293,58.6%) which was the correct answer the best prophylactic measures against CCHF, agreed with research in Pakistan demonstrated that most of participants were aware of the most effective preventive methods for CCHF (11). The most effective defense against CCHF is to wear clothing and apply insect repellent on exposed areas of skin. DEET-containing repellents work particularly well in keeping ticks away. The Centers for Disease Control and Prevention (CDC) highly recommends taking these actions (17). Following these guidelines is important to reduce the risk of CCHF transmission. The study revealed that nurses (n=384,76.8%) who had correctly identified CCHF as a zoonotic disease. CCHF was a zoonotic disease. A disease caused by a virus transmitted by ticks can be symptomless in animals but is a significant danger to humans (19).

The study appeared that (n= 294,58.8%) of the nurses participating in the trial provided the correct responses regarding the transmission of CCHF through the air. CCHF was not airborne. The main mode of transmission is by bites from infected ticks, specifically of the *Hyalomma* genus, or via direct contact with blood or tissues of infected ticks, viraemic people, or viraemic livestock (20). The study revealed that (n=373,74.6%) of the nurses answered correct answer that CCHF can be spread by water. (CCHF) is primarily transmitted by ticks and can also be contracted through contact with infected animal tissues during or after slaughter, or by direct contact with blood or tissues of infected ticks, patients, or livestock (20).

The study revealed that most answers which was correct about CCHF can be transmitted through social contacts such as sharing clothes, cups, plates, spoons, glasses, bathrooms, shaking hands, and kissing, among the nurses were(n=305,61.0%). The result agreed with a study conducted in Pakistan revealed that most healthcare workers provided the correct answer (21). Mostly spread by ticks, especially those belonging to the *Hyalomma* genus. The virus could be transmitted by direct contact with infected animals or humans' blood or tissues, particularly in healthcare workers environments when medical equipment is not properly sterilized or reused (22).

The study revealed that most correct answers (n=339,76.8%), regarding the complete cure of CCHF with medications. Primarily supportive care was provided to patients with CCHF; in addition to administering proper therapy for secondary infections, emphasis should be given to the correction of electrolyte imbalances, fluid balance, oxygenation, hemodynamic support, and antiviral medication gave encouraging outcomes (23).

The study revealed that nurses who reported having contact with the feces, urine, and saliva of an infected person were more likely to provide incorrect answers (n=387, 77.4%). CCHF mainly spread through bites from infected ticks or by direct contact with blood or tissues of infected ticks, humans with the virus in their bloodstream, or livestock with the virus in their bloodstream (22). The result disagreed with a study held in Pakistan revealed that most of the participants gave the correct answer for having contact with the feces, urine, and saliva of an infected person (21). The study revealed that most of the participating nurses (404 ,80.8%) answered "No" when asked if avoiding mosquito bites protects CCHF which was incorrect. The result agreed with a study done in Pakistan found that participants most of participants gave the incorrect answer when asked the same question (21). Preventing mosquito bites could be essential in reducing the risk of mosquito-borne diseases such as CCHF. The study revealed that nurses (n=395,79%) correctly responded that there was no vaccination available for CCHF. At present no globally utilized vaccination for (CCHF).

The study was supported by research conducted in Turkey, revealing that (91.9%) of nurses from Amasya were knowledgeable, were aware of the absence of a vaccination for CCHF (24). Also the study showed that the number of nurses whose their total correct answers from the total question in the table which were (19) question they were (n=347,69.4%) who divided into to five categories according to their level of answers (poor ,moderate ,good , very good and excellent),the results appeared that the group who answered (10 - 11) correct answers were poor (n=95 ,27%), while the most of nurses whose total answered (12 - 13) correct answers were moderate (n=127 ,37%), but the group who their correct answers (14 - 15) were good (n=73 ,21%), while the group that their correct answers (16 - 17) were very were good (n= 43 ,12 %), and the group who answered(18 - 19) questions were excellent (n= 9 , 3%) (Figure -1).

Although the total number of correct answers out of the total number of questions was (n=347,69.4%), which showed that they had knowledge but it was not enough when most of their correct answers appeared moderate (n=127 ,37%) which was not at the required level for nurses due to the spread of the disease and its epidemiology in the region Nurses should be aware of more information to prevention when dealing with epidemic disease could be affected with direct contact with infected or suspected cases. The study was agreed with a study conducted in Pakistan on the knowledge of nurses, that showed nurse was not had the optimal result when in knowledge section included 24 questions and assessed by Items were evaluated in multiple-choice questions. If they correctly answer 14 questions, he/she regarded as having good knowledge.

C. Association between Nurses' Knowledge of Crimean-Congo Hemorrhagic Fever with their Socio-Demographic Variables

The study identified differences in the necessary information and practice for nurses that could be addressed in future educational and learning activities. The findings also demonstrated that nurses used less authentic sources of information; this should be addressed immediately as it ultimately affects knowledge (11). The findings of the study demonstrated that there were no statistically significant differences in association between nurses'

knowledge of Crimean Congo Hemorrhagic Fever with their socio-demographic variables with regard to nurses (sex, age, and years of service) ($p=0.080$, $p=0.064$, $p=0.116$) respectively, but there were statistically significant differences association between nurses' knowledge toward (CCHF) with their socio-demographic variables with regard nurses' qualification and source of information nurses' ($p=0.037$, $p=0.043$), nurses' level of education could be a key determinant of knowledge of the disease and its transmission, as well as attitudes and practices, especially those that involve the integration of community efforts for dengue control (25). Also agreed with a study in Kagadi district, Uganda " showed that knowledge levels and preventive practices, which could be related to socio-demographic variables like education and information sources (26). A study in Pakistan" revealed that knowledge level significantly differed by age, sex, and experience ($p < 0.001$) (21).as well as a study conducted in Pakistan, which showed the responses were significantly ($p < 0.005$) varied by age, profession, and experience, the study showed the responses were significantly differed by experience, profession, age, category of practice ($p < 0.005$) (11).

Conclusion

The nurses' knowledge towards Crimean-Congo Hemorrhagic Fever (CCHF) was not optimal.

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