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Knowledge of Critical Care Unit Nurses Regarding Care of Patient with Hemorrhagic Fever

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Abstract: Hemorrhagic fevers are severe viral infections that cause vascular damage, multiorgan dysfunction, and high mortality rates, posing a major challenge to healthcare systems, particularly in resource-limited settings. Nurses working in intensive care units (ICUs) are at the forefront of managing these infections; thus, their knowledge of infection prevention and control (IPC) measures is critical for effective patient care and containment of disease spread. This study aimed to assess ICU nurses' knowledge regarding hemorrhagic fever and related IPC practices. A descriptive exploratory design was employed, including 184 nurses who completed a validated, self-administered questionnaire developed through literature review and expert evaluation for content validity and clarity. The findings revealed that most participants demonstrated adequate awareness of infection control principles: 85.3% recognized that hand hygiene is necessary before and after procedures, and 98.9% understood that it helps prevent hospital-acquired infections. Additionally, 98.9% of nurses were aware that the primary role of personal protective equipment (PPE) is to protect healthcare workers and minimize pathogen transmission. However, 73.8% of participants showed insufficient knowledge regarding the consistent application of standard precautions to all patients, indicating a significant gap in practice-related understanding. Overall, 51.3% of the nurses achieved a satisfactory knowledge level regarding hemorrhagic fever. Higher knowledge scores were significantly associated with older age, higher educational attainment, and longer years of professional experience, while gender showed no significant relationship. The study concludes that although nurses exhibit good awareness of key IPC measures, deficiencies in understanding standard precautions highlight the need for regular, targeted training programs and continuous education to strengthen infection control practices within intensive care units.

Keywords: Nurses Knowledge, Hemorrhagic Fever, Intensive Care Unit

Introduction

Viral hemorrhagic fevers (VHF) include a variety of conditions that can vary in severity from moderate to life-threatening, marked by high mortality rates. The classification of these diseases encompasses four distinct families: Arenaviridae, Bunyaviridae, Flavivirus, and Filovirus [1]. Because they are zoonotic, most viruses associated with these diseases require vectors to spread to humans. The majority of these illnesses are either transmitted by arthropods or rodents, and they are often restricted to the endemic areas inhabited by their hosts. Many VHF viruses possess infectious characteristics, with specific varieties, such as arenavirus and filovirus, exhibiting elevated infection rates [2]. Transmission among persons. happens by direct contact with body fluids and contaminated blood. Viral hemorrhagic fevers can cause nonspecific symptoms such as headache, fever, myalgia, and problems with the gastrointestinal or upper respiratory tract [3]. According to the World Health Organisation (WHO), the Crimean-Congo hemorrhagic fever virus has been sporadically observed in major outbreaks in Iraq, Iran, Oman, Saudi Arabia, Kuwait, the

United Arab Emirates, and Pakistan, all located in the Eastern Mediterranean area [4]. Prevention is the most effective strategy for addressing such epidemics, given the limited therapeutic options available. This can be achieved by enhancing hospitals' readiness for VHF outbreaks, augmenting staff capabilities to identify hazards, and providing essential infrastructure for the safe care of infected individuals. The Infection Prevention and Control (IPC) methods implemented by hospitals are crucial for protecting healthcare providers, patients, and the environment. The implementation of fundamental IPC measures, such as standard precautions, is essential for ensuring safe healthcare delivery [5].

Methodology

A descriptive exploratory design was used in this study. A convenient sample of all available nurses working at the intensive care units in the previously mentioned units and agreed to participate in the study, (184) nurses were recruited in this study. The data were gathered using a questionnaire (Self –administration questionnaire). The questionnaire included questions on infection prevention and control (IPC) knowledge, nurses' knowledge and practice about standard precautions for hemorrhagic fever. The study tool (a questionnaire) has been designed and constructed based on an extensive review of available literature and related studies. Face validity of the instrument is established through a panel of (10) experts in the different fields. These experts have more than 7 years of experience in their specialist and asked to review and evaluate the instrument format for its content, clarity and adequacy. On basis of their comments and suggestions, some modification was made and changes were performed. Then, the questionnaire was considered valid after taking into consideration their suggestions and recommendations. The nurses' knowledge scores were evaluated using Descriptive and Inferential statistics to analyze the study data.

Results

The study included a nearly equal gender distribution among nurses in intensive care units, with 48.9% male and 50.5% female, reflecting a balanced workforce. The majority of participants were between 31–40 years (46.7%), followed by those aged 19–30 years (34.4%), suggesting a relatively young and potentially dynamic workforce. The length of service was highest among those with 6–15 years of experience (52.5%), indicating a moderate level of professional maturity, while only 7.1% had over 25 years of service.

Table 1. Socio demographic Characteristics of the Nurses in intensive care units.

Variable	Category	Sample Size (N)	Percentage (%)
Gender	Male	91	48.9
	Female	93	50.5
Age	19-30	62	34.4
	31-40	84	46.7
	41->60	38	18.9
Length of service	≤5 Years	55	30.1
	6-15	96	52.5
	16-25	19	10.4
	>25	14	7.1
Academic qualification	Certificate	15	8.2
	Diploma	120	65.9
	Bachelors	43	23.6
	Masters	4	1.7
	Doctorate	2	0.6

Approximately 60.7% (111) of the study participants have standard precautions for health care policies in his institution, about 60.7% had heard the word “standard precautions” and 83.8% formal training is the source of information.

Table 2. Characteristics of Nurses workers in pediatric hospital among infection prevention.

Variable	Category	Sample Size (N)	Percentage (%)
Do you have standard precautions for health care policies in your institution?	Yes	111	60.7
	No	73	39.3
Have you ever heard the word "standard precautions"?	Yes	176	96.7
	No	6	39.3
If yes, mention the source of information	-Colleague, friend, What's App, and Others	28	16.2
		145	83.8
	-Formal training		

A total of 184 participants (85.3%) knew that hand hygiene is necessary before and after procedures, 177 (98.9%) were aware that hand hygiene decreases the risk of transmission of hospital-acquired pathogens, and 181 (96.15%) of the participants were aware that hand hygiene is performed even when hands may be not obviously dirty before patient contact. About 137 participants (76.5%) of the study participants were adequately knowledgeable on the importance of infection control measures, they knew that these measures could limit the spread of resistant microorganisms and reduce antimicrobial misuse, and 159(87.9%) were aware that the prevention of hospital-acquired infections is an essential part of a nurse's role. The study participants were adequately knowledgeable about personal protective equipment. Almost all participants 98.9% were aware that the primary use of personal protective equipment (PPE) is to protect healthcare workers (HCWs) and reduce opportunities for transmission of microorganisms in healthcare facilities. As for the standard precautions, 136 (73.77%) participants were not knowledgeable about using these precautions and 48(26.23%) did not know that these were not only to be used in patients diagnosed with infectious diseases or knew when to use standard precautions.

Table 3. General Knowledge questions for nurses who works in Critical care unit regarding care of patient with hemorrhagic fever.

Knowledge Question	Classification	Frequency	Percentage %
1. Hemorrhagic fevers are primarily caused by:	correct	177	96.9
A. Bacteria	incorrect	7	5.1
B. Viruses			
C. Parasites			
D. Fungi			
2. Which of the following is NOT a viral hemorrhagic fever?	correct	181	98.9
	incorrect	3	1.1
A. Ebola			
B. Lassa Fever			
C. Yellow Fever			
D. Tuberculosis			
3. What is the most common mode of transmission for Ebola Virus Disease?	correct	180	99.5
	incorrect	4	0.55
A. Airborne droplets			
B. Mosquito bites			
C. Direct contact with blood and body fluids			
D. Contaminated food			
4. Common early symptoms of hemorrhagic fevers include: (Select all that apply)	correct	158	87.3
	incorrect	26	12.7
A. Fever			
B. Headache			

C. Bleeding D. Joint pain E. Skin rash			
5-Which symptom indicates progression to severe disease? A. Sore throat B. Internal bleeding C. Mild headache D. Muscle cramps	correct incorrect	137 47	76.5 23.5
6. What type of precautions should be taken when caring for a patient with hemorrhagic fever? A. Standard Precautions only B. Contact and Droplet Precautions C. Airborne Precautions D. Contact, Droplet, and Airborne Precautions	correct incorrect	55 129	29.5 70.9
7. The correct order for donning Personal Protective Equipment (PPE) is: A. Gloves → Mask → Gown → Goggles B. Gown → Mask → Goggles → Gloves C. Mask → Gloves → Gown → Goggles D. Gown → Goggles → Mask → Gloves	correct incorrect	159 25	87.9 12.2
8. What is the cornerstone of treatment for viral hemorrhagic fevers? A. Antibiotics B. Supportive care and symptom management C. Antifungal therapy D. Surgical intervention	correct incorrect	9 175	3.85 96.15
9. Which nursing intervention is most critical for a patient with bleeding complications? A. Encouraging ambulation B. Monitoring vital signs every 8 hours C. Minimizing invasive procedures D. Administering cough suppressants	correct incorrect	48 136	26.23 73.77

Table 4. IPC Knowledge questions for nurses workers in the intensive care units.

Knowledge Question	Category	Frequency	Percentage %
1.Hand hygiene with soap and water or an alcohol-based antiseptic decreases the risk of transmission of hospital-acquired pathogens	Yes No	177 7	96.9 5.1
2.The primary use of personal protective equipment (PPE) is to protect healthcare workers (HCWs) and reduce opportunities for transmission of microorganisms in healthcare facilities	Yes No	181 3	98.9 1.1
3. Sharp items should be disposed of in containers that are puncture resistant, leak-proof, closable, and labeled with the biohazard symbol	Yes No	180 4	99.5 0.55
4. Masks protect against bodily fluid exposure when splashing occurs	Yes No	158 26	87.3 12.7
5-Infection prevention and control measures can limit the spread of resistant microorganisms and reduce antimicrobial misuse	Yes No	137 47	76.5 23.5

6.Gloves provide complete protection against acquiring/transmitting infection	Yes	55	29.5
	No	129	70.9
7.Prevention of hospital-acquired infections is an important part of a health care worker's role	Yes	159	87.9
	No	25	12.2
8.If my hands are not visibly dirty, there is no need to wash my hands prior to patient contact	Yes	9	3.85
	No	175	96.15
9.Standard precautions are set of Infection Control practices used to prevent transmission of Healthcare Acquired Infections (HAI'S) and are only to be used in patients diagnosed with infectious diseases.	Yes	48	26.23
	No	136	73.77
10.Since gloves may prevent hand contamination, it is not necessary to wash hands after removing gloves	Yes	29	15.93
	No	155	84.07
11.When Standard Precautions alone cannot prevent transmission, they are supplemented with transmission-based Precautions	Yes	160	88.61
	No	24	11.39
12.Clean disposable gloves are worn during direct contact with blood/body fluids, mucous membranes, non-intact skin, or any other potentially infectious material	Yes	157	87.71
	No	27	12.29
13.N95 mask is needed when in contact with a suspect or a known hemorrhagic fever patient	Yes	161	88.46
	No	23	11.54
14.There is no need to wash hands after doing procedures that did not involve bodily fluids	Yes	35	18.9
	No	149	81.4
15.All patients are sources of infection regardless of their diagnoses	Yes	151	82
	No	33	17.9
16.Hand hygiene is necessary only before procedures are performed	Yes	27	14.7
	No	157	85.3
17.Used and disposable PPE item is disposed of in a black garbage bag	Yes	90	49.7
	No	94	50.3

Discussion

Being adequately knowledgeable about hemorrhagic fever at intensive care units in infection prevention and control of safer IPC activities is important in preventing and controlling the spread of health care associated infections in a healthcare setting and provided an important baseline information about knowledge for hemorrhagic fever among Nurses workers in critical care unit [6], [7], [8]. The overall knowledge level among nurses regarding hemorrhagic fevers was mixed, with strong performance in some areas but notable gaps in others:

High Knowledge Areas:

Cause of hemorrhagic fevers (96.9%), with most correctly identifying viruses.

Transmission mode for Ebola (99.5%) and correctly identifying viral hemorrhagic fevers (98.9%).

Understanding early symptoms (87.3%) and PPE donning order (87.9%).

Moderate to Low Knowledge Areas:

Only 76.5% correctly identified internal bleeding as a sign of disease progression.

These findings were like those of a study conducted in Alexandria, Egypt [9].

The findings of the study showed that 53.07% of the Nurses workers in critical unit were adequately knowledgeable on infection control. which found out that 53.7% of the nurses were knowledgeable about infection prevention [10], [11], [12].

A significant gap was observed in understanding appropriate infection control precautions, with only 29.5% choosing the correct combination of contact, droplet, and airborne precautions. This

suggests a serious vulnerability in implementing effective infection control practices, especially during outbreaks[13], [14].

Alarmingly, only 3.85% correctly identified supportive care as the cornerstone of treatment for viral hemorrhagic fevers, while 96.15% chose incorrect options, including antibiotics and antifungals, which are not effective for viral infections. This reflects a critical gap in clinical management knowledge. The findings of this study are in line with those of the study conducted in Jordan [15]. Most nurses have mid-level education and rely heavily on formal training for their knowledge, this was the same as the findings in studies in China [16].

Conclusion

The findings indicate a generally adequate baseline knowledge among ICU nurses regarding hemorrhagic fevers. Most nurses have mid-level education and rely heavily on formal training for their knowledge, there is a pressing need to integrate more advanced, disease-specific training modules into both pre-service and in-service education, especially on infection prevention measures and supportive management protocols. The results of this study calls for regular educational programs and developing professionals' educational level by policy makers is recommended. These recommendations include continuous supervision in order to assure adherence to IPC guidelines by nurses.

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