

Original Article

Awareness of Nursing Students About Nipah Virus Infection: A Cross-Sectional Study

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Abstract

Objective: This study aimed to determine the awareness of nursing students regarding Nipah virus infection.

Methodology: A cross-sectional analytical study was conducted among 72 nursing students from a public sector nursing college. Data were gathered pertaining to their knowledge of the epidemiology, clinical manifestations, complications, and prevention of Nipah virus infection using a structured questionnaire. Data were analysed using SPSS version 27.0. Descriptive statistics were used. The normality of the data was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Owing to the non-normality of the data, the chi-square test was applied to determine the association between categorical variables. Statistical significance was set at $P < 0.05$.

Results: The mean age of the participants was 21.6 ± 0.54 years. Of the 72 nursing students, 62.5% of the students had heard about Nipah virus, while 63.9% correctly identified it as a viral infection. About 80.6% knew about its transmission to others. 52.8% were adequately aware of the natural reservoirs of Nipah virus. Most (68.1%) students identified encephalitis as a significant complication. Preventive measures like avoiding partially eaten fruits (73.6%), using personal protective equipment (83.3%), hand hygiene (76.4%), and isolation of cases (84.7%) were broadly acknowledged. Most (61.1%) received information about this deadly virus from social media. Significant associations were observed between age groups and knowledge of the natural reservoir ($P < 0.05$) and isolation from cases as a preventive practice ($P < 0.02$).

Conclusion: Nursing students had moderate awareness of Nipah virus infection. Social media played a pivotal role in knowledge acquisition about the Nipah virus.

Keywords: Nipah virus, nursing students, encephalitis, natural reservoir, social media.

Introduction

Nipah virus infection is a fatal zoonotic disease with a Case Fatality Rate (CFR) estimated to be 40%-75%. It is transmitted to humans through fruit bats or flying foxes of the *Pteropus* species, which have been identified as the natural hosts for the Nipah virus.¹ It has been recognised as a pandemic potential, as it has triggered destructive epidemics in Southeast Asia.² The Centers for Disease Control and Prevention has designated this virus as a Category C biological threat because of its potential public health impact.³ The Nipah virus was detected for the very first time in 1999 when there was an epidemic of encephalitis among pig farmers in Malaysia,⁴ and abattoir staff in Singapore,⁵ and approximately 100 deaths among 300 infected cases were reported. Nipah virus cases usually present with high-grade fever, headache, myalgia, and emesis that may progress to acute encephalitis and respiratory distress.⁶ It has a broad spectrum of clinical presentations that may culminate in epilepsy and coma.⁷ Apart from its spread in healthcare facilities, this virus can also be transmitted to family members via close contact.⁸

Nipah virus was also identified among two healthcare workers in West Bengal, India, in December 2025 due to contact at the workplace.⁹ The incubation period is 5-21 days. It can swiftly progress to encephalitis and multi-organ failure, although its earlier clinical manifestation is like influenza.¹⁰ Due to the non-availability of an approved vaccine

Contributions:

RS SQ - Conception, Design
SR RK AR FP - Acquisition, Analysis, Interpretation
RK AR FP SQ - Drafting
RS SR - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

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Data Availability Statement: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Institutional Review Board

Approval

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against the Nipah virus, the World Health Organization (WHO) has declared it as a significant public health concern that should be subjected to research in Biosafety Level-4 (BSL-4) laboratories.¹¹

Although no confirmed Nipah virus case has been detected in Pakistan, there is an increased likelihood of contracting positive cases in the country due to certain ecological reasons.¹² The National Institute of Health (NIH) Islamabad has issued strict advisories to alert all health departments and healthcare workforce about the high fatality rate of this disease and the availability of laboratory-based diagnosis kits.¹³ This study aimed to determine the awareness of nursing students in Pakistan regarding the Nipah virus. As future frontline health workers, nursing students may encounter suspected or confirmed cases of Nipah virus at their workplaces. Getting equipped with adequate knowledge about the epidemiology, transmission, clinical manifestations, and preventive measures of Nipah virus infection is of paramount significance for the safety of healthcare providers as well as the general public. Hence, gauging the awareness level among nursing students can help recognise knowledge gaps and guide educational interventions to strengthen preparedness for the escalating threat of Nipah virus outbreaks.

Methodology

A cross-sectional analytical study was conducted among 72 fourth-semester BSc Nursing students from a public sector nursing hospital who were 4th semester BSc Nursing students. This study was approved by the Institutional Ethical Review Board of Rawalpindi Medical University (letter no. 450/IREF\RMU\2026). They were enrolled in the study through consecutive non-probability sampling after providing informed consent. Using a 4.5% prevalence of Nipah virus infection calculated in a hospital-based surveillance study in Bangladesh,¹⁴ a South Asian country, the minimum required sample size computed by using the WHO sample size calculator with a 95% confidence level and a 5% margin of error was 66. After adding a 10% non-response rate, the final adjusted sample size was 72.

This study was conducted and reported in accordance with the STROBE guidelines. Data were gathered with the informed consent of the students. A structured questionnaire based on closed-ended questions regarding the origin of Nipah cases, its causes, mode of transmission, common symptoms, natural reservoir, resultant complications, and source of information was used to collect the responses. The junior students of the 1st and 2nd semesters and seniors of the last semester were excluded. Data were analysed using SPSS version 27.0. Descriptive statistics were applied to the data. The Kolmogorov-Smirnov and Shapiro-Wilk tests were applied to test the normal distribution of the data. The chi-square test was applied to determine the association between categorical variables. Statistical significance was set at $P < 0.05$.

Results

Responses regarding awareness of Nipah virus infection were obtained from 72 nursing students at a public sector nursing school. The mean age of the nursing students in the current study was 21.6 ± 0.54 years. About 58.3% of the students were 21-23 years old, while 41.7% of the students were 18-20 years old. Of the 72 nursing students, 45 (62.5%) had heard about Nipah virus infection, and 63.9% correctly attributed this infection to a virus, as depicted below in Figure 1. 80.6% of the nursing students opined that Nipah virus can be transmitted from animals to humans, and 79.2% of the respondents confessed that human-to-human transmission can also occur. According to the nursing students, 75% of the healthcare workers could contract this infection from the patients. Most (48.6%) of the students accurately claimed that the detection of the Nipah virus for the very first time in Southeast Asia was presented below in Figure 2.

Adequate awareness of the natural reservoir of Nipah virus infection was observed among 52.8% of the respondents. However, 15.3% and 11.1% perceived dogs and cats as natural reservoirs of Nipah virus. 8.3% considered poultry as a natural reservoir of Nipah virus, while 12.5% did not know about it. The knowledge of nursing students regarding the mode of Nipah virus transmission is presented in Table 1.

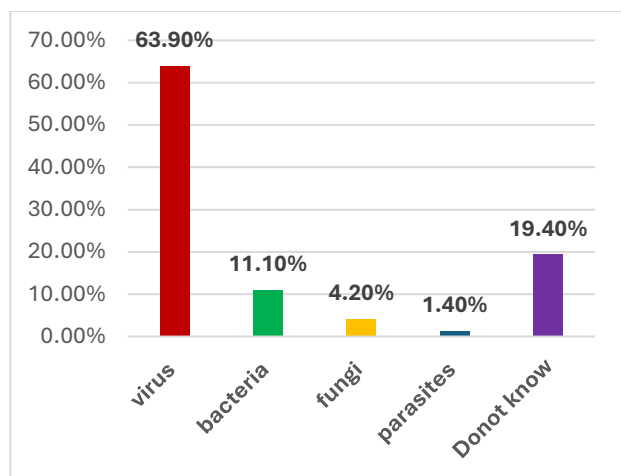


Figure 1: Etiology of Nipah virus specified by the nursing students

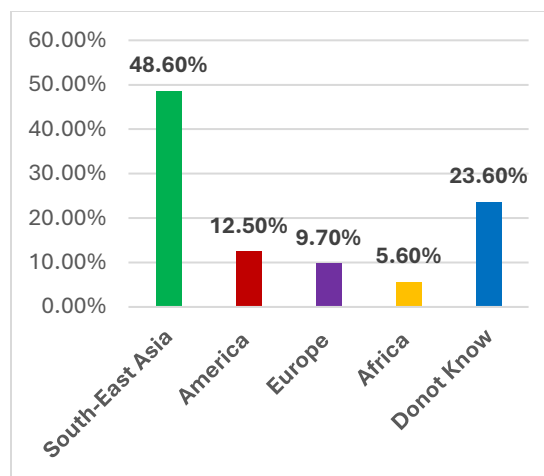


Figure 2: Awareness about the region with primary identification of Nipah virus

Table 1: Knowledge of Nursing students about mode of transmission of Nipah virus

Mode of Transmission of Nipah virus	Frequency (%)
contact with infected bats + consumption of contaminated fruits + close contact with infected persons	21 (29.2%)
consumption of contaminated fruits or fruit products	15 (20.8%)
close contact with infected persons	11 (15.3%)
contact with inf bats + consumption of contaminated fruits + close contact with infected persons + airborne transmission	7 (9.7%)
Do not know	7 (9.7%)
consumption of contaminated fruits + close contact with infected persons + airborne transmission	6 (8.3%)
Contact with infected bats	3 (4.2%)
Airborne transmission	2 (2.8%)

Most (68.1%) of the respondents affirmed that encephalitis was the critical complication resulting from Nipah virus infection. Similarly, the majority (73.6%) acknowledged that refraining from eating partially eaten fruit can help prevent Nipah virus infection. According to 83.3% and 76.4% of students, using Personal Protective Equipment (PPE) and frequent hand washing can markedly mitigate the risk of Nipah virus infection. The students' viewpoints on common symptoms associated with Nipah virus infection are presented in Table 2.

Table 2: Common symptoms associated with Nipah virus infection

Symptoms	Frequency (%)
fever + headache + resp distress + altered consciousness	17 (23.6%)
fever + headache + resp distress + altered consciousness + skin rash	13 (18.1%)
Respiratory distress	12 (16.7%)
Do not know	12 (16.7%)
fever + headache	7 (9.7%)
Skin rash	6 (8.3%)
Headache	3 (4.2%)
Altered consciousness	2 (2.7%)

84.7% recognised isolation as a key measure to arrest the spread of Nipah virus. 40.3% of the nursing students opined that there is no approved vaccine against Nipah virus infection. 13.9% of students confessed to never hearing about Nipah virus, while the majority (61.1%) got information from social media, as depicted below in Figure 3.

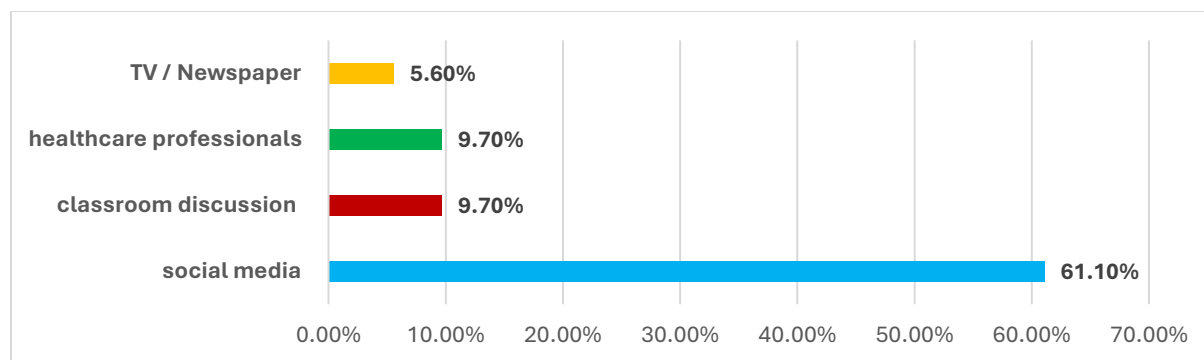


Figure 3: Source of Information about Nipah virus

On applying the Kolmogorov-Smirnov test and Shapiro-Wilk test, data were found to have a non-normal distribution with a P-value of all the variables < 0.001. Due to the non-normality of the data, a non-parametric test was applied, and the chi-square test was applied to determine the association of categorical variables, as illustrated in Table 3.

Table 3: Association of categorical variables

Variables	Age Groups		χ^2	P-value
	18-20 years (n = 30)	21-23 years (n = 42)		
Correct response about the cause of Nipah virus infection	21	25	0.90	> 0.20
Correct response about the region where Nipah virus was identified first	18	17	2.63	> 0.10
Correct response regarding the animals considered as natural reservoir of Nipah virus	20	18	4.01	< 0.05*
Correct response about the transmission of Nipah virus to humans	24	34	0.012	> 0.20
Correct response regarding the human-to-human transmission of Nipah virus	25	32	0.54	> 0.20
Correct response about the mode of transmission of Nipah virus	25	34	0.064	> 0.20
Correct response about the possibility of healthcare workers being infected with Nipah virus	23	31	0.076	> 0.20
Correct response about severe complication of Nipah virus infection	21	28	0.091	> 0.20
Adequate knowledge about prevention of Nipah virus infection by avoiding the consumption of partially eaten fruits	22	31	0.003	> 0.20
Correct response regarding role of hand hygiene in preventing Nipah virus	24	31	0.374	> 0.20
Knowledge about importance of isolation of infected person to limit virus transmission	29	32	5.66	< 0.02*
Correct response regarding vaccine availability for Nipah virus	12	18	0.04	> 0.20

Discussion

Of the 72 nursing students, most (58.3%) were 21-23 years old. 63.9% and 80.6% of students in the current study were well aware of the aetiology and zoonotic nature of Nipah virus infection. Approximately 79.2% of respondents opined that this virus is also transmissible from one person to another through close contact. A similar study was also done among 17- 20-year-old nursing students in India who were pre-tested for their knowledge about Nipah virus, followed by exposure to a structured learning module and then pre-tested for their adequacy of knowledge. This interventional study emphasises the need to incorporate a structured educational module pertaining to the Nipah virus in the BSc Nursing curriculum due to its high case fatality rate.¹⁵ Likewise, a study by George et al. among medical students in India revealed adequate awareness about the Nipah virus. Approximately 43.5% of the Indian students had substantial information about the epidemiology of this emerging virus.¹⁶ According to the World Health

Organization (WHO), the only way to manage Nipah virus infection in the absence of authentic treatment or preventive measures is to strengthen public awareness and understanding of Nipah virus epidemiology and mode of transmission.¹⁷ Knowing about the mode of transmission will not only facilitate the mitigation of the risk of Nipah virus transmissibility but also be beneficial in diminishing the potential risk among healthcare workers.

About 25-30% of the nursing students in the present study accurately knew about the symptoms linked with Nipah virus infection. However, most (68.1%) confidently declared encephalitis as the most critical complication of Nipah virus. About 40.3% confidently stated about non-availability no approved vaccine against Nipah virus. A cross-sectional study among healthcare workers in Saudi Arabia to assess their knowledge about Nipah virus revealed a poor median score (45%). 62% of the workers knew about the associated symptoms and complications, while 36.8% affirmed the non-availability of the vaccine to arrest Nipah virus infection.¹⁸ 18-20 years old nursing students knew more about the animal that is the natural reservoir of Nipah virus ($P < 0.05$), as evident from Table 3. Similarly, the knowledge of 18-20 years old students in the current study about the importance of isolation in limiting Nipah virus transmissibility was significantly better ($P < 0.02$) than that of 21-23 years old students. A cross-sectional study by Aziz et al. among physicians of a tertiary care facility in Bangladesh elucidated that overall knowledge about Nipah virus infection among 21- 25-year-olds was significantly better than that among those above 26 years of age.¹⁹ Similarly, a study by Himes L et al. among the healthcare workforce of India revealed that 95% of them knew about fruit bats as the primary reservoir for Nipah virus and about 79.8% were acquainted with human-to-human spread of this virus through droplets. Knowledge assessment scores were comparatively higher among doctors than among nurses, while nurses attained more positive attitude scores.²⁰ The high case fatality rate associated with Nipah virus infection has streamlined the preparedness of healthcare professionals to effectively manage and control potential epidemics by isolating infected cases.²¹ Enhancing surveillance and strengthening infection prevention and control practices are of paramount significance in tackling emerging infectious outbreaks.

Most (61.10%) of the nursing students in the present study gained information about Nipah virus from social media. This depicts the increasing predilection of the younger generation towards social media. A descriptive study conducted among Pharmacy and Engineering students in India revealed that newspapers were a key source of information about the Nipah virus, followed by social media.²² Consistent with our findings, a study by Mokbul MI et al. among the general population during the Nipah virus outbreak illustrated that most (29.9%) came to know about this deadly virus through social media, while 25.41% and 18.95% got familiarised with this infection through television and educational institutes, respectively.²³ Another study among healthcare professionals in Kerala showed that most of them gained information about the fatality of the Nipah virus through newspapers, followed by television and the Internet. Most of them had adequate knowledge of the clinical manifestations and diagnostic modalities available for Nipah virus detection.²⁴ Information dissemination through media, health campaigns, and educational interventions can help the public adopt preventive measures against infectious agents and optimistically modify their attitudes and behaviour towards outbreaks. The small sample size and the fact that responses were only obtained from nursing students about Nipah virus epidemiology and prevention are the limitations of our study. As no case of Nipah virus has been reported in Pakistan, this may contribute to the prevailing knowledge gap. Surveying the community can help a great deal to rectify myths about infections and guide effective public health preparedness.

Conclusions

Although most nursing students had heard about the Nipah virus and knew about its aetiology, there were considerable gaps in their knowledge pertaining to its mode of transmission and clinical manifestations. Most of them were well-versed in preventive measures against the Nipah virus, but there was a scarcity of knowledge about vaccine availability. Incorporating emerging zoonotic diseases into nursing curricula is substantially needed to enhance nursing students' knowledge and preparedness. Rigorous training sessions at the workplace for Infection Prevention & Control (IPC) are of fundamental importance for their reflexive behaviour. Educational authorities should promote the use of reliable learning sources, such as evidence-based medical literature and official websites, to procure information about public health emergencies.

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