Proceeding of the Public Health and Well-being Conference, Vol. 1, 2022, pp. 156-167

ISSN 2659-2096
DOI: https://doi.org/10.32789/publichealth.2022.1013

Assessing Health Care Students' Knowledge, Attitude, and Preparedness Towards Monkeypox

Reddem Jalaja Reddy[1], Mrinmoy Roy[2], T Giri Teja[3], Dr. R. Sarala[4]

[1]*Institute of Health Management and Research, jalaja11121998@gmail.com*
[2]*Institute of Health Management and Research, mrinmoy.r@iihmrbangalore.edu.in*
[3]*Institute of Health Management and Research, Tamaranagiriteja0718@gmail.com*
[4]*Institute of Health Management and Research, sarala.r@iihmrbangalore.edu.in*

ASSESSING HEALTH CARE STUDENTS' KNOWLEDGE, ATTITUDE, AND PREPAREDNESS TOWARDS MONKEYPOX

Abstract: During the covid-19 pandemic, many people don't know the causes, effects, and modes of transmission of the new virus, and the entire world is in a panic state. According to the World Health Organization (WHO), monkeypox is currently on the rise and has spread to Africa. An orthopoxviral based zoonotic illness known as monkeypox causes a smallpox-like vesicular pustular illness in humans. The evolution of monkeypox, epidemiology, with a focus on the number of confirmed, likely, and/or potential cases, age at presentation, mortality, and geographic distribution of cases across West and Central Africa, has been discovered through systematic analysis of the research and published literature. Healthcare practitioners worldwide are attempting to become familiar with the varied clinical manifestations and therapy for this infection, and public health organizations are also seeking to contain the current outbreak.

Keywords: Monkeypox; epidemiology; pandemic; preparedness; mortality

Introduction

Aim of the Study

To assess the knowledge, attitude, and preparedness of healthcare students/ volunteer workers in major metro cities of India towards Monkeypox through a cross-sectional study.

Methodology

A standardized English-based, anonymous and online questionnaire was diffused via social media platforms to all healthcare students/ volunteer workers. The questionnaire consisted of 28 questions related to sociodemographic characteristics, knowledge-based, attitude-based, and pandemic preparedness. Descriptive statistical analysis was used to summarize data.

Results

A total of 28 questionnaires were completed; the participants were able to know > 90% of the knowledge-based questions regarding Monkeypox. Most of the respondents were concerned about getting infected and their families due to their professional exposure. Similarly, most were following the safety recommendations. Most of the participants agreed that awareness about Monkeypox should be included in the curriculum. In terms of Monkeypox readiness, about 74% of students/volunteer workers have a medium level of knowledge.

Discussion

The national and hospital-level measures of COVID-19 readiness were identified and carried out by the health ministry. 24 subcategories were used to categorize readiness at the hospital level, and the majority of participants concurred that they are experiencing mask and hand sanitizer shortages, price increases, and supply delays. Additionally, there is a lack of a well-functioning surveillance system for early disease detection, a general lack of understanding and awareness of the monkeypox disease, and a shortage of qualified healthcare workers. This study evaluated healthcare students' attitudes, knowledge, and readiness about monkeypox, with 197 participants identified as gay, bisexual, or having sex with other males. All of them had mucocutaneous lesions, and 67% adhered to safety advice. The majority of hospitals have made actionable steps to prepare for COVID-19. Monkeypox, an African rodent disease, was brought to the USA in 2003 and spread to 11 states, resulting in 82 infections in children and adults. This outbreak highlighted the lack of a well-functioning surveillance system,

knowledge and awareness of the disease, healthcare facilities already overburdened by COVID-19 cases, and a shortage of qualified healthcare workers. 197 participants identified as gay, bisexual, or having sex with other males had mucocutaneous lesions, and 170 reported systemic illness.

Final Conclusion

Our findings revealed there is a lack in appropriate level of knowledge and good practice towards Monkeypox, among the respondents from healthcare organizations. National organisations may benefit in utilizing the expertise of healthcare students/ volunteer workers to be able to minimize/avoid future strikes of Monkeypox if it emerges.

Background

A developing sickness called monkeypox is also referred to as vesicular pustular infection. It is a zoonotic illness and resembles smallpox (Orthopoxvirus). 70% of the world's population lacks smallpox immunity. The first reported case of Monkeypox was reported in 1970 after being discovered in 1958 (WHO, 2023). The infectious sickness began when monkeys were brought from Singapore to Denmark (Moore *et al.*, 2022). Pustules, lesions, rashes, fever, respiratory problems, swollen lymph nodes, and malaise are some of the clinical signs of monkeypox. 5 to 15 days pass during incubation (Abdelaal *et al.*, 2022). The fundamental difference between monkeypox and smallpox is early lymph node enlargement, which typically occurs with the onset of fever (WHO, 2023). Although the clinical symptoms of both diseases are relatively similar. Lesions start concurrently with the rash and progress at a comparable rate frequently 1-3 days after a fever and lymphadenopathy onset (CDC, 2022). Usually, just the body's edges are affected when someone has a major illness. Human-to-human transmission occasionally happens in primary human cases, although it is infrequently in secondary cases. The illness, which was initially discovered in central Africa, has spread due to imported cases of monkeypox.

The monkeypox virus is a zoonotic virus that causes the disease of the genus Orthopoxvirus, family Poxviridae, and sub-family Chordopoxvirinae. In 1970, the first case of human monkeypox was recorded in the Democratic Republic of the Congo (1).

There is complete cross-immunity between smallpox and monkeypox, according to investigations of antibody responses to different orthopoxvirus species. The spread of the monkeypox virus from the second of these cases to a healthcare worker (HCW) and steps were taken by the public health department to stop further instances. Healthcare staff should wear Personal protective equipment and maintain proper biomedical waste management, and proper maintenance of laundry because lesions are more in monkeypox cases. It can be spread via., Direct contact, Oral transmission, contamination through clothes & sexual contact.

Methods

Study Design

This study used data from an anonymous online survey and was cross-sectional in nature. From September 8 until September 30, 2022, it was held. Students studying health care administration from across India (Major Metro cities.) and the United States (Alumni of IIHMR Bangalore working there) participated in the voluntary survey. A google forms survey was conducted using a snowball sampling strategy. Through the social media platforms Facebook, WhatsApp, and mail. Participants were both healthcare professionals and students of health management. The google form link has been shared to the respondents through these apps in their profiles to collect responses.

Sample size

300 samples were taken with the help of snowball sampling. In this study, the authors used the Taro Yamane method for sample size calculation formulated by the statistician Tara Yamane in 1967 to determine the sample size from a given population. Below is the mathematical illustration for the Taro Yamane method:

$n= N/ (1+N (e)^2)$

Where:

n signifies the sample size

N signifies the population under study

e signifies the margin error (it could be 0.10, 0.05 or 0.01)

We will illustrate with the above formula to determine the sample size from a given population.

Institute of Health Management Research have 3 centres in Jaipur, Delhi and Bangalore with a total healthcare student base of about 600. The sample size would be:

$n= N/ (1+N (e)^2)$

Where:

n signifies the sample size

N signifies the population under study

e signifies the margin error

$n= 600/ (1+400(0.05)^2)$

n= 600/ (1+ 400(0.0025)

n= 600/ (1+1)

n= 600/2

n= 300

Survey Development

There are 28 components in the questionnaire, all of which are multiple-choice and dichotomous in nature. The components of the questionnaires were reconstructed taking reference from (Zeenny *et al.*, 2020). It was written in the English language. Questions consist of demographic information (from 1 to 5), knowledge (from 6 to 18), attitude (19 to 22), and practice (23-28). The student responses of healthcare students are compiled in an Excel document and converted to SPSS.

Data management and statistical analysis

The Statistical Package for the Social Sciences was used to conduct statistical analyses (SPSS). Calculated descriptive statistics were used. Mean and standard deviations were reported for variables.

The frequency and percentage are used to evaluate and describe categorical variables.

Data Analysis

General Characteristics of health care students

A total of 300 healthcare students were included in the survey. (Mean age is 25.85 years ± SD 0.8). The highest percentage of respondents was from Bangalore & Hyderabad. The great majority had a Medical background while 42.9 % are doctors, 34.4% are paramedical, 16.6% are pharmacy, and 6.1% are physiotherapists

Table 1 Characteristics of healthcare students

Characteristics of the Health care management students	300 samples
Age (mean SD)	25.85 0.8
Are you willing to answer	300
Yes No	297 (99%) 3 (1%)
Educational background	297
Medical	247 (83.2%)
MBBS,BDS,AYUSH	106 (42.9%)
Physiotherapy	15 (6.1%)
Pharmacy	41 (16.6%)
Paramedical	85 (34.4%)
Non-medical	50 (16.8%)

Knowledge related to Monkeypox

Knowledge of health care students was appropriate for most questions (more than 70%), particularly regarding monkeypox causes, infections, how it spreads, and what all preventive measures can be taken to avoid the monkeypox virus.

Table 2 Knowledge of healthcare students related to Monkeypox

Questions-12	
Do you know about monkeypox	297
Yes	269 (90.6%)
No	28 (9.4%)
How do you know about Monkeypox	269
Books	27 (10%)
Social media	198 (73.6%)
Journals & articles	33 (12.3%)

Lectures	11	(4.1%)
What is monkeypox	269	
Infectious & zoonotic disease	39	(14.5%)
Communicable disease	33	(12.3%)
Similar kind of smallpox	24	(8.9%)
All of the above	173	(64.3%)
Is monkeypox a new disease	269	
Yes	72	(26.8%)
No	142	(52.8%)
Maybe be both	55	(20.4%)
In which year the first case of monkeypox was identified	269	
1958	78	(29%)
1970	87	(32.3%)
1978	64	(23.8%)
1982	40	(14.9%)
Could you identify the symptoms of monkeypox	269	
Skin-to-skin contact	66	(24.5%)
Fever	48	(17.8%)
Covid-19 symptoms	24	(8.9%)
Pustules, malaise, respiratory illness	131	(48.7%)
Is monkeypox related to COVID-19	269	
Yes	23	(8.6%)
No	205	(76.2%)
Maybe be both	41	(15.2%)
How monkeypox can be transmitted from one to other	269	
Human-to-human transmission	60	(22.3%)
Animal to human transmission	53	(19.7%)
Maybe be both	149	(55.4%)
None of the above	7	(2.6%)
How serious the monkeypox disease is	269	
Mild disease (2-4 weeks)	63	(23.4%)
Fatal disease	21	(7.8%)
Severe disease in some cases	72	(26.8%)

All the above	113	(42%)
Is monkeypox a sexually transmitted disease	269	
Yes	92	(34.2%)
No	138	(51.3%)
Maybe be both	39	(14.5%)
If you know you are exposed to monkeypox what measures you will take	269	
Vaccination	35	(13%)
Quarantine without meeting health care provider	14	(15.2%)
Self-medications	6	(2.2%)
Personal Hygiene	21	(7.8%)
All the above	193	(71.7%)
What complications arise if a person has monkeypox	269	
Secondary infections	59	(21.9%)
Corneal involvement	7	(2.6%)
Pneumonia & sepsis	35	(13%)
All the above	168	(62.5%)

		Education status of the respondent		Total
		Medical	non-medical	
Knowledge group	low (1 to 4)	28	8	36
	medium (5 to 8)	189	31	220
	high(9 to 12)	31	10	41
Total		248	49	297

The attitude of healthcare care students towards monkeypox

The majority of healthcare students were concerned about getting infected and their families due to exposure.

Table 3 Attitude towards monkeypox

If you are exposed to monkeypox do you think you should get vaccinated	269	
Yes	190	(70.6%)
No	19	(7.1%)

Maybe be both	60	(22.3%)
If yes, what kind of vaccine you will prefer to take	262	
JYNMEOS vaccine	151	(57.4%)
Smallpox Vaccine	88	(33.5%)
COVID vaccine	16	(6.1%)
Others specify	7	(3%)
If you want to test for monkeypox what kind of test you will do (preference)	269	
X-Ray	4	(1.5%)
Polymerase chain reaction	153	(56.9%)
Routine Blood investigation	84	(31.2%)
None of the above	28	(10.4%)
If pandemic arrives again they will be more demand for drugs so what kind of planning you want to take	269	
Inventing new equipment's so drug production will increase	17	(4.9%)
Supply chain management	22	(8.3%)
Implementing new strategies to meet market demand	23	(8.7%)
All the above	207	(78.1%)

Knowledge, attitude and preparedness analysis of Monkeypox

Distributed the scores according to knowledge assessment and recoding is done for Low (1-4), medium (5-8), and high (9-12).

Attitude assessment for low (0-2), medium (3), high (4)

Preparedness assessment low (0-2), medium (3-5), high (6-7)

Age interval is 5 years.

Frequency Tables

Table 4 Knowledge frequency table

Knowledge Group					
		Frequency	%	Valid %	Cumulative %
Valid	low (1 to 4)	37	12.3	12.3	12.3
	medium (5 to 8)	222	74	74	86.3
	high(9 to 12)	41	13.7	13.7	100
	Total	300	100	100	

Table 5 Attitude frequency table

Attitude Group					
		Frequency	%	Valid %	Cumulative %
Valid	Low (0 to2)	112	37.3	37.3	37.3
	Medium(3)	125	41.7	41.7	79

	High (4)	63	21	21	100
	Total	300	100	100	

Table 6 Preparedness frequency table

Preparedness Group					
		Frequency	%	Valid %	Cumulative %
Valid	Low (0 to 2)	39	13	13	13
	Medium (3 to 5)	184	61.3	61.3	74.3
	High (6 to 7)	77	25.7	25.7	100
	Total	300	100	100	

Table 7 Age group frequency table

Age_group					
		Frequency	%	Valid %	Cumulative %
Valid	18 to 22	67	22.3	22.3	22.3
	23 to 27	190	63.3	63.3	85.7
	28 to 32	26	8.7	8.7	94.3
	33 to 37	10	3.3	3.3	97.7
	38 to 42	4	1.3	1.3	99
	43 and above	3	1	1	100
	Total	300	100	100	

Table 8 Statistics of knowledge, attitude and preparedness assessment

		Knowledge_assesment	attitude_assesment	Preparedness_assesment
N	Valid	300	300	300
	Missing	0	0	0
Mean		6.4267	2.5867	4.3433
Std. Deviation		2.47353	1.16634	1.78402

Table 9 one sample statistics

One-Sample Statistics				
	N	Mean	Standard. Deviation	Standard.Error Mean
Knowledge_assesment	300	6.4267	2.47353	0.14281
attitude_assesment	300	2.5867	1.16634	0.06734
Preparedness_assesment	300	4.3433	1.78402	0.103

Table 10 One sample test

One-Sample Test						
	Test Value = 70					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowledge_assesment	-445.162	299	0	-63.57333	-63.8544	-63.2923
attitude_assesment	-1001	299		-67.41333	-67.5459	-67.2808
Preparedness assessmentt	-637.44	299	0	-65.65667	-65.8594	-65.454

Discussion

The national and hospital-level measures were the final checklist's two key domains. Three components of national readiness were identified and carried out by the health ministry. 24 subcategories were used to categorize readiness at the hospital level (2). The majority of the participants concurred that they are experiencing mask and hand sanitiser shortages, price increases, and supply delays. Approximately 50% of hospitals have taken action to be COVID-19-ready (3). COVID-19 readiness can give an assumption of future readiness for any such epidemic or pandemic.

When monkeypox, an African rodent disease, was brought to the USA in 2003 and spread to 11 different states, this perspective underwent a significant shift. This outbreak, which resulted in more than but significant 82 infections in children and adults in the United States (WHO, 2023) made it clear that the trade in exotic animals presents health risks, and scientific research greatly expanded our understanding of this zoonosis(5). These include a lack of a well-functioning surveillance system for early disease detection, a general lack of understanding and awareness of the monkeypox disease, a lack of healthcare facilities already overburdened by COVID-19 cases, and a shortage of qualified healthcare workers (6).

These include a lack of a well-functioning surveillance system for early illness diagnosis, a general lack of knowledge and awareness of the monkeypox disease, a lack of healthcare facilities already overburdened by COVID-19 patients, and a shortage of qualified healthcare personnel (7). The participants' average age was 38. There were 197 participants in all, 196 of whom identified as gay, bisexual, or having sex with other males. All of them had mucocutaneous lesions, which most frequently affected the genitalia (111 participants, 56.3%) or the perianal region (82 participants, 41.6%). Participants who reported systemic illness totalled 170 (86.3%) (8).

Similarly to that, about 67% adhered to the safety advice. The majority of the participants concurred that they are experiencing mask and hand sanitiser shortages, price increases, and supply delays. A little more than 50% of hospitals have made actionable steps to prepare for COVID-19 (9).

As far as we are aware, this is the first study to evaluate healthcare students' attitudes, knowledge, and readiness about monkeypox. The relative sample size of 300 is one potential limitation representing only the healthcare student/ volunteer group. Furthermore, the survey was conducted in English. Therefore, we can conclude a relatively low attitude compared to knowledge and preparedness assessment. Finally, as surveys were self-administered and certain healthcare students may have understood some questions differently, there is a chance of information bias. However, it is advised that these flaws be taken into account in future research, there is no reason to think that doing so would alter the key findings we found.

Conclusion

Our findings revealed an appropriate level of knowledge and preparedness towards monkeypox among healthcare students. However, healthcare students are not practically engaged by the monkeypox in the syllabus so preparedness among them is comparatively less than knowledge because the ANOVA test is not significant as a whole. A further longitudinal study should be done with more number of samples from different districts and towns of India with stratified random sampling. World health organization has announced a monkeypox emergency so to avoid and prevent the monkeypox virus and mitigate the risk of these waves emerging. Awareness campaigns should be implemented by the public health ministry.

References

Aatish Patel.,2022, Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series, 2022-072410.

Abdelaal, A., Serhan, H.A., Mahmoud, M.A. *et al.* Ophthalmic manifestations of monkeypox virus. *Eye* **37**, 383–385 (2023), 251072422.

C Chastel.,2008, Human monkeypox, 18394820.

Clinical Recognition | Mpox | Poxvirus | CDC, Clinical Recognition | Mpox | Poxvirus | CDC, date of access-march 27, 2023.

Daniel WW. Biostatics: A Foundation for Analysis in the Health Sciences. 7th ed. New York, NY: John Wiley&Sons;1999, 0-471-16386-4.

Hesam Seyedin.,2021, The main factors of supplier-induced demand in health care: A qualitative study, 34084796.

Hesam Seyedin.,2021, Developing a hospital preparedness checklist to assess the ability to respond to the COVID-19 pandemic, EMHJ – Vol. 27 No. 2 – 2021.

Junis Tumewu.,2020, An adult patient with suspected of monkeypox infection differential diagnosed to chickenpox, 32874456.

McCollumA.M.,2014, Human monkeypox, 24158414.

Marlyn J., 2023, Mpox (Monkeypox), 34662033.

Olivier Uwishema.,2022, The burden of monkeypox virus amidst the Covid-19 pandemic in Africa: A double battle for Africa, 35855873.

Rony M. Zeenny.,2020, Assessing knowledge, attitude, practice, and preparedness of hospital pharmacists in Lebanon towards COVID-19 pandemic: a cross-sectional study, 32959004.