



Knowledge of Medical Professionals toward Monkey pox virus in Karachi, Pakistan: A Cross-Sectional Study

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ABSTRACT

Background: Monkeypox disease (MPD) is a relatively rare viral infection. Recently, health officials in Pakistan have been alerted to confirmed cases of monkeypox in non-endemic countries, including the United Kingdom.

Objective: This study aims to investigate the knowledge of medical professionals about monkeypox disease in Karachi, Pakistan, to better understand the factors contributing to the emergence and management of the disease.

Methods: This cross-sectional study was conducted by using an open online self-administered survey through Google Forms. The survey data were taken between January and April 2023. The study respondents were 470. Of the 430 participants included in the final analysis, 54.40% were female, and all were "somewhat knowledgeable" about monkeypox disease. The associations between independent factors and either knowledge or attitude were assessed.

Results: A total of 550 questionnaires were distributed via online, but only 470 were received back. Among these 470, forty questionnaires have been found to be incomplete, and they were excluded from the study. The current study included 430 questionnaires with a response rate of 90%. The result showed that 56.27% were aware of monkeypox disease (MPD), while 22.79% were uninformed of it, and 22.94% lacked adequate knowledge of MPD. 40% of respondents believe immunizations can prevent monkeypox disease (MPD). Data strongly depended on gender, with female predominance. The majority of females, 54.40%, determined themselves to be somewhat knowledgeable.

Conclusions: This study concludes that there is a gap in awareness among healthcare professionals. Medical professionals might require educational interventions to overcome their lack of expertise, allowing for more accurate diagnosis and treatment.

Keywords: Medical practitioners, monkeypox disease, knowledge, Karachi.

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INTRODUCTION

A tropical disease that was not recognized until the 1970s [1] was monkeypox. It has been resurfacing every 10 to 20 years since the smallpox eradication service ended in 1980 [2]. It most recently exploded in 2022 during COVID-19, which affected 110 nations, with 87,000 cases reported and 112 fatalities [3]. This puts the world economy at even greater risk of further burdening itself.

A rare viral illness that affects both humans and animals, monkeypox has long been prevalent in parts of Central and West Africa. The monkeypox virus, which belongs to the genus Orthopoxvirus in the family Poxviridae, was identified for the first time in 1958, and the first human case of monkeypox was recorded in the Democratic Republic of the Congo (DRC) in 1970 [4]. The monkeypox virus is prevalent in 12 endemic countries, according to the World Health Organization (WHO). The biggest number of confirmed cases recorded between May 13 and 21, 2022, came from the United Kingdom, surpassing all other countries on this list [5]. According to a notification from the National Institute of Health (NIH) on May 23, 2022, which stressed that the virus could also break out in Pakistan due to the spread of the monkeypox virus in non-endemic nations like the US and the UK, national and provincial health authorities in Pakistan were placed on high alert [6]. On May 26, 2022, non-endemic nations reported nearly 200 confirmed or suspected instances of monkeypox infection [7]. In the middle of this world upheaval, information about possible monkeypox cases in Pakistan quickly went viral on social media [8].

The virus can spread from person to person through the placenta, contact with lesions, and fomites [9]. Since 1986, there has been a dramatic rise in the prevalence of MPD [10]. Health authorities in Pakistan reported that no suspected cases of monkeypox virus infection have been confirmed in the country to date. The statement followed the admission of two pediatric patients at the National Institute of Child Health (NICH), Karachi, who presented with cutaneous rashes and vesicular lesions. The children were subsequently placed in an isolation unit as a precautionary measure after concerns were raised by parents of other admitted patients. It was further noted that most diagnostic laboratories in Pakistan currently lack the capacity to

detect the monkeypox virus through confirmatory testing [11].

Outside of its endemic regions, MPD is still spreading, and as of May 26, the World Health Organization (WHO) documented 257 laboratory-confirmed cases and 120 suspected cases worldwide [12].

WHO continues to promote the dissemination of information about this monkeypox outbreak. At the WHO and in many member states, clinical and public health incident response has been activated to coordinate thorough case discovery, contact tracing, laboratory investigation, clinical management, isolation, and application of infection and preventive and control measures. The development of interim advice will help Member States with surveillance, laboratory diagnostics and testing, case investigation and contact tracing, clinical care, vaccinations and immunization, risk communication, and community participation. [12]

The clinical symptoms of monkeypox are largely the same as those of smallpox, including pyrexia, headache, back and head pain, rash, malaise, and exhaustion, with the exception of lymphadenopathy [13, 14]. Bushmeat handling, direct contact, infected oropharyngeal discharge, and animal hosts such as squirrels, rats, and prairie dogs are all routes by which the virus is spread [15]. Additionally, a number of risk factors, including human-animal contact, the end of the smallpox vaccine program, and growing globalization, indicate that MPD will continue to be a global public health issue [16].

Pakistan has an unequal distribution of scarce resources and a low-middle income status. The government only allocated 1.2% of GDP to health in 2021, which is much less than the WHO's 5% recommendation [17]. Pakistan has a less than 40% overall literacy rate [18]. Less than 30% of students complete their undergraduate degrees. Basic knowledge of basic health rights is lacking as a result of ignorance and illiteracy.

Despite this, Pakistan does not have many MPDs. The Pakistani health authorities should start the training of healthcare professionals (HCPs) and develop preventative plans to prepare the workforce in case an MPD emergency happens. In order to determine whether educational training has improved HCPs' awareness of how to address the threat, this study was conducted to evaluate their attitudes and knowledge of MPD in Pakistan.



If the population is informed about the illness and how to stay safe from the virus, the spread of MP can be stopped. It is essential for the general population to possess adequate knowledge regarding monkeypox, its associated burden, and preventive measures to minimize transmission within communities and households. Evidence indicates a direct association between knowledge, attitudes, and practices in relation to various infectious diseases [19]. Given the designation of monkeypox as a public health emergency, awareness programs play a pivotal role in disease control. Furthermore, there is an urgent need to conduct multiple surveys to assess the level of awareness among the general population as well as students from diverse academic disciplines, considering that adults with queer sexual orientations have been identified as a particularly vulnerable group. Accordingly, the present study was designed to evaluate the knowledge and attitudes of health profession students towards monkeypox and to compare these findings with those of students from non-medical fields.

METHODS

Study Design and Duration

This descriptive, cross-sectional study was conducted from January to April 2023 to analyse the knowledge and attitude of medical professionals of Karachi, Pakistan, about monkeypox disease. Prior to starting the survey, a review of the literature was done. Additional information was collected from regulatory agencies like the World Health Organisation and the Centres for Disease Control and Prevention's official websites (CDC).

Study Population and Eligibility Criteria

All medical professionals registered with the Pakistan Medical and Dental Council were identified as a target population.

Eligibility criteria

Included all medical professionals working in the public and private sectors of hospitals and clinics of Karachi, Pakistan. Our study excluded those working in other areas of healthcare, those who refused to participate, and those who provided insufficient information.

Sample Size and Sampling Technique

The sample size was calculated using online software for sample size calculation (Raosoft Inc.®, Seattle, DC, USA). The required sample size calculation was 377. A questionnaire was developed by reviewing the available literature on the topic. The questionnaire consists of six questions related to demographic information and four questions related to the knowledge of the respondents.

Statement of Consent and Ethical Consideration

Prior to the data collection, the respondents were briefed about the aims and objectives of the study, and their consent was obtained. The involvement in the research was voluntary with secrecy. The respondents were neither pressurised nor incentivised for their participation.

Data Collection and Analysis

The questionnaires were left with the respondents for a week. Following this time period, the filled questionnaires were collected. The questionnaire items were analysed with IBM SPSS version 25 (Statistical Package for Social Sciences, IBM Corporation, Armonk, New York, NY, USA). Descriptive statistics and frequency were used to demonstrate respondents' demographic information and responses of participants.

RESULTS

Five hundred and fifty questionnaires were distributed online, but only 470 were received. Out of 470, forty were found to have missing information and were therefore excluded. 430 responses were included in the data for the current investigation. Out of 430 respondents, 33.72% (145) were male, while 66.27% (285) of respondents were female. Most of them (58.13%) were between 25 and 35 years old, and the majority were practising in public sector healthcare settings. Around half of the practitioners (51.16%) were in faculties of medical colleges. Almost a quarter of them 27.90% were general practitioners, followed by chief medical officers and heads of department. Fifty percent of the participants have one to five years of professional experience and are located in the urban area, as shown in Table 1.



Table 1: Demographic Information of Respondents

Demographic Information	Frequency (%)
Gender	
Male	145 (33.72)
Female	285 (66.27)
Age	
25–35 years	250 (58.13)
36–45 years	115 (26.74)
46–55 years	25 (5.81)
56–65 years	20 (4.65)
66 and above	20 (4.65)
Organization	
Govt.	225 (52.32)
Private	205 (47.68)
Designation	
General practitioners	120 (27.90)
Chief medical officer	70 (16.27)
Head of department	20 (4.65)
Faculty	220 (51.16)
Years of Experience	
1 to 5 years	219 (50.93)
5 to 10 years	72 (16.74)
10 to 15 years	110 (25.58)
Above 20 years	29 (6.74)
Location	
Urban	240 (55.81)
Peri-urban	190 (44.18)

Table 2: Cross-Illustration of Respondents' Demographics with Awareness

Demographics	Knowledge Regarding MPD			
	No Knowledge	No Adequate Knowledge	Somewhat Knowledgeable	Adequate Knowledge
Gender				
Male	28 (19.31)	35 (24.13)	78 (53.79)	4 (2.75)
Female	65 (22.80)	55 (19.30)	155 (54.40)	10 (3.50)
Designation				
General Practitioners	26 (21.66)	16 (13.33)	70 (58.33)	8 (6.66)
Chief medical officer	15 (21.42)	10 (14.28)	40 (57.14)	5 (7.14)
Head of department	6 (30)	3 (15)	9 (45)	2 (10)
Faculty	30 (13.63)	53 (24.09)	132 (60)	5 (2.27)
Years of Experience				
1-5 years	10 (2.74)	6 (18.26)	200 (91.32)	3 (1.36)
5 to 10 years	9 (12.5)	20 (27.8)	40 (55.55)	3 (4.16)
10 to 15 years	30 (27.27)	20 (18.18)	55 (50)	6 (5.45)
Above 20 years	2 (6.8)	3 (10.34)	22 (75.86)	2 (6.9)

Only a small segment of male respondents (2.75%) considered themselves to be adequately knowledgeable. More than fifty percent (54.40%) of females considered themselves to be somewhat

knowledgeable; males had more knowledge as compared to females. The status of knowledge was not significantly associated with the experience and designation of respondents, as shown in Table 2.



However, more than half (52.63%) of females believed they are somewhat knowledgeable. The conclusion can be established with the fact that males had more knowledge than females. But an independent correlation of knowledge with experience and designation of respondents was observed. Mass media (50%) and medical literature (20%) were found to be the major sources of information for MPVD, depicted in Figure-1. Additionally, the participants considered that the main source of transmission is from animal to human (i.e., 43%) through skin lesions (43%). About 43% of respondents considered that these are the actual

reasons for transmission and causes of disease in humans. Figures 2 and 3 present the response ratio in support of the respondent's retort. The majority of clinicians reflected that only supportive medical treatment is the working management of the disease right now. Reactions to the multiple options in the sequence of this question are presented in Figure 4. Figure 1 describes the responses of participants regarding the source of information for monkeypox virus disease. Approximately 50% considered the positive role of mass media in spreading awareness about the disease, and medical literature was found to be the 20% source of information for MPVD.

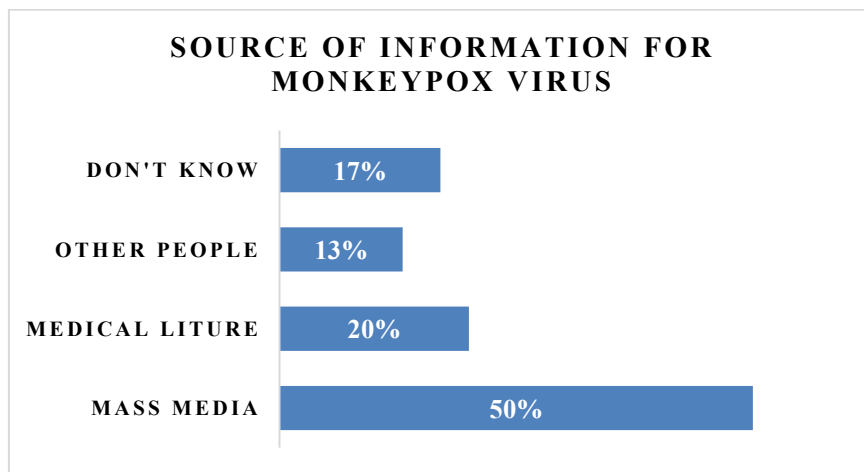


Figure 1: Source of Information Regarding MPD

Figure 2 summarizes the details about the route of transmission of monkeypox disease, the main source of transmission is from animal to human 43%.

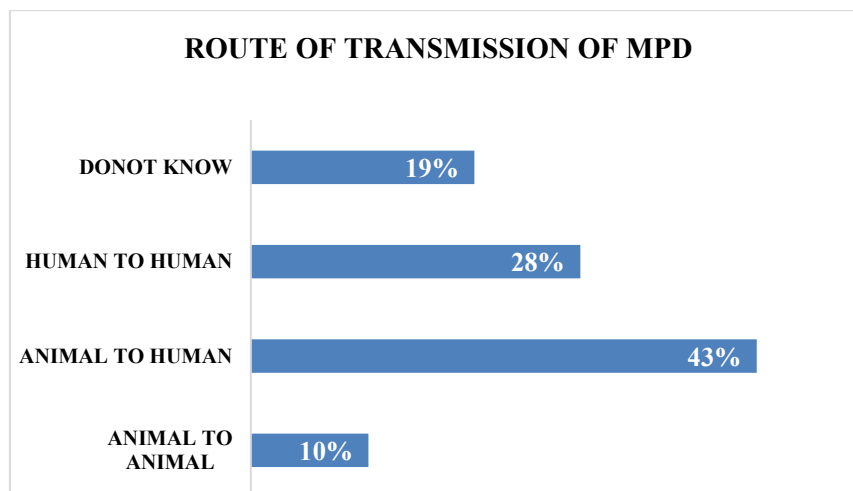


Figure 2: Route of Transmission of MPVD



Figure 3 describe the responses of participants regarding knowledge of source of infection of MPD,

the main source of infection is skin lesions 43% followed by body fluid and secretions.

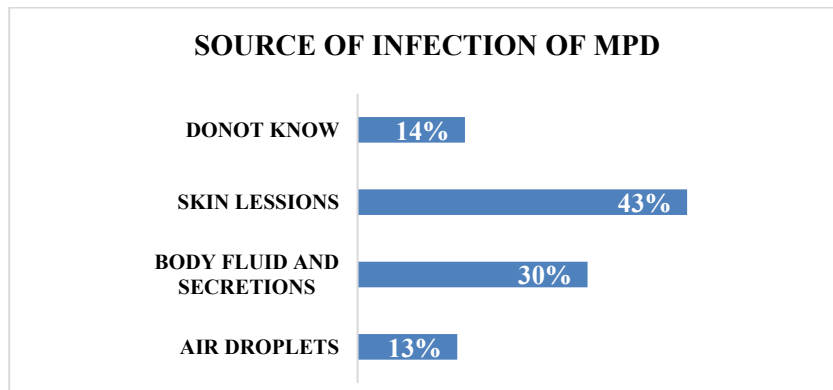


Figure 3: Source of Infection Regarding MPD

Figure 4 summarizes the details towards management of MPD. Very low percentage of participants agreed that patient should stay and rest

at home and majority have positive attitude towards supportive treatment.

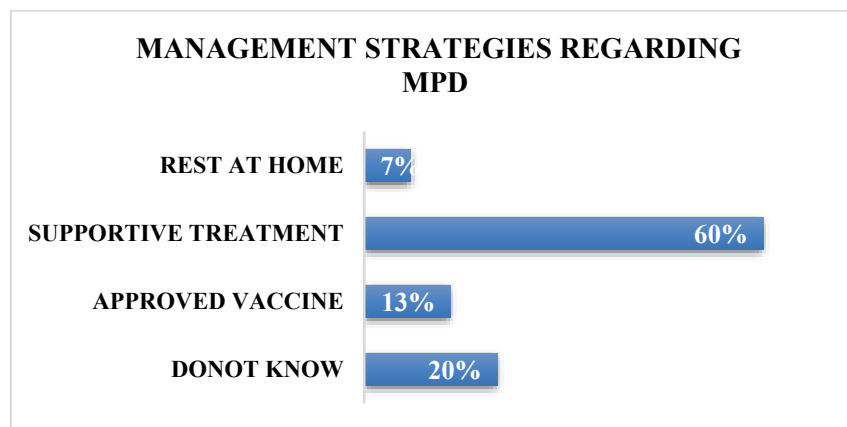


Figure 4: Management Strategies Related to MPD

DISCUSSION

Monkeypox is a viral disease that is part of the Orthopox virus group [20], and a recent occurrence of continuing outbreaks of neglected diseases is extremely concerning [21]. Pakistan reported its first confirmed case of monkeypox in April 2023 [22]. The spread of the virus to the country is almost inevitable. Considering the burden that has been inflicted by the COVID-19 pandemic on Pakistan’s already struggling healthcare system [23-27], several precautionary measures need to be ensured to prevent its continuous decimation. In the past, co-epidemics and

co-occurrences of viral diseases such as dengue fever, Zika, chikungunya, Crimean-Congo hemorrhagic fever, measles, and poliomyelitis along with the COVID-19 infection have resulted in numerous casualties that could’ve been prevented by taking the advanced precautionary measures [28, 29]. Pakistan’s healthcare system faced various obstacles during the COVID-19 pandemic due to its lack of financial resources. The scarce health budget of Pakistan made it extremely difficult for hospitals and health providers to ensure the availability of adequate manpower, ventilators, hospital beds,



healthcare professionals, and laboratory equipment [30]. Therefore, to avoid a monkeypox/COVID-like outbreak in Pakistan, relevant health authorities must employ a proactive approach and initiate nationwide awareness campaigns that emphasize the importance of effective hygiene practices, self-quarantining, and other relevant safety protocols. The struggling health care system will be on the verge of collapse if monkeypox starts to spread. Pakistan does not have any diagnostic facility for the virus; the health department has declared samples can be sent abroad for testing in case of emergencies, which further threatens the spread [31]. To tackle this situation, physicians need to have adequate knowledge regarding the presenting signs and symptoms of the disease to assure the timely quarantine of suspected patients instead of symptomatic treatments only.

Additionally, hospitals should be prepared with well-equipped isolation units to quarantine patients immediately to limit the spread of the contagious virus. Furthermore, proper surveillance systems need to be developed to monitor cases and deal with them accordingly. If a patient presents with monkeypox, a proper history should be taken to rule out the origin of the virus, and the people in close contact should also be monitored. Preventive measures that can assist in dealing with any suspected case before its spread include public awareness sessions in which people are educated about the presenting atypical pox rash and its progressive stages, which include atypical macules, papules, vesicles, pustules, and scabs. Pakistan has a massive number of flights coming from the regions where monkeypox is on the rise; screening for the virus should be mandated at the airports, and suspected or confirmed cases must be quarantined for a prodromal period. We suggest the healthcare designing committees come forward with the strategies to overcome the onset of the outbreak in its initial stage and formulate a plan for close gatherings, schools, or daycare centers, which could be the primary transmission hub for this disease. The government should channel a well-designed program to prevent the country from economic, business, and commercial losses in any such unfortunate future circumstances.

Pakistan cannot afford to bear the burden of an endemic since it is a developing nation still making

economic amends for the COVID-19-caused damages. The greatest preventative methods to successfully stop or manage a potential monkeypox outbreak in the nation include increasing awareness among healthcare professionals and the general public, instituting stringent surveillance systems, and promptly tracing contacts (in case of a viral outbreak). Expert-issued recommendations state that widespread smallpox immunization efforts are not necessary. Instead, a ring vaccination strategy must be used, in which only those who come into touch with infected people receive the vaccine [32]. In this manner, the difficulties brought forth by the constrained worldwide supply of smallpox vaccine and the pervasive vaccination hesitancy [33] in Pakistan can be somewhat resolved.

WHO recommends every country's health care system should receive at least 5% of its GDP. The study's participants unanimously agree that pandemic MPD might put further strain on the country's economy. The participants' worries about the illness are partially justified. Fortunately, Pakistan is one of the safe nations where no MPD cases have been reported. However, NIH rejected a case involving a 25-year-old male who had traveled to Islamabad [24]. However, the absence of diagnostic facilities and healthcare infrastructure for infectious diseases in Pakistan requires a careful analysis and the implementation of strategies for overcoming this deficiency.

CONCLUSION

This study concludes that there is a gap in awareness among healthcare professionals. Medical professionals might require educational interventions to overcome their lack of expertise, allowing for more accurate diagnosis and treatment. This study highlights that in order to mitigate any emergency infectious disease burden, strong health policy should be developed to eradicate any emergency infectious disease burden, and knowledge of infectious diseases should be promoted.

Conflict of Interest

The authors declare that there is no conflict of interest.



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