



Vol. 3 No. 3 (March) (2025)

A Systematic Review of the Epidemiology of Human Monkeypox Outbreaks and Implications for Outbreak Strategy

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Abstract

This study aims to evaluate young people's awareness, knowledge, and attitudes toward infectious disease "monkey-pox". By identifying gaps in understanding, we can develop targeted educational campaigns that empower youth to make informed decisions. Ultimately, this research seeks to promote healthier choices and reduce the risks associated with this disease.

Methodology: A questionnaire survey was created using Google Forms and distributed via social media platforms, targeting individuals aged 18 to 40. The collected data were analyzed using Statistical Software (SPSS).

Results & Discussion: In this study n=100 participants were participated in the survey 45 were females and 55 were males, the participants were 18 years-40 years of age including (25) males and (30) females, 20 years-30 years (25) males and (30) females whereas 30 years-40 years of age included. (45) males and (5) females, among them n=50 use sanitizer/soaps while n=50 do not use this. N=80 respondents respond that they don't know about monkeypox infectious disease,



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n=20 participants faced headache, muscle pain and fever n=70 respond that there is no need for vaccination whereas n=30 respond that vaccination is necessary.

Conclusion: The main objective of this survey is to foster awareness about the health risks posed by monkeypox, which can lead to serious health consequences. By enhancing public understanding, we can take proactive steps to reduce and prevent the effects of this illness. This study highlights the need for a collaborative health system that works closely with schools and workplaces. Through impactful awareness sessions, we can empower communities to recognize risks and adopt preventive strategies effectively.

Introduction

As the world continues to navigate the challenges of the SARS-CoV-2 pandemic, we face the emergence of another zoonotic disease: monkeypox. This is a virus that is affiliated to smallpox and which is no longer confined to Central and West Africa alone but has spread to America, Europe, North Africa, Middle East and Australia. Since May, over 4,000 cases of monkeypox have been confirmed in more than 40 countries, in Western Europe, North America, and Australia, where the disease is not endemic. However, the current outbreak of monkeypox has not been considered to be a Public Health Emergency of International Concern by the World Health Organization WHO. We must continue to be watchful and keen as this situation unfolds. As earlier stated, the WHO has just published a report containing the considerations of the expert committee on the current monkeypox outbreak. The committee recognized that the current position is quite exceptional, as the virus has affected many countries where monkeypox has not been identified. Some of the committee members raised some questions as to why younger persons have not developed significant immunity to poxvirus, which means that there will be more and continuous cycles of transmission in the larger population.

Following consultations, the committee decided and recommended to the WHO Director-General that, at this stage, the outbreak should not be characterized as a PHEIC. However, they emphasized precaution, saying that the issue of monkeypox should be followed closely. Besides, they recommended that the epidemiological situation should be reassessed in several weeks to identify trends. Monkeypox is a viral infection that is transmitted from animals to humans and is caused by the monkeypox virus. It results in a rash that looks like that of smallpox disease. But unlike smallpox, monkeypox is comparatively less transmissible from one person to another and has lower case mortality ratios.

After the appearance of the monkeypox virus in non-endemic countries including the USA and the UK, the national and provincial health authorities in Pakistan were alerted on May 23, 2022. This was in response to a notification from the National Institute of Health (NIH), which indicated the Monkeypox outbreak in Pakistan. As of 26 May 2022, approximately 200 confirmed or suspected monkeypox cases have occurred in non-affected countries. In the middle of such a situation in the world, news about suspected cases of monkeypox in Pakistan was circulating on social networks. However, the NIH rejected these allegations stating that no monkeypox case has been reported in Pakistan.

While no one in Pakistan has been officially diagnosed with monkeypox to date, the virus entering the country appears almost inevitable. Since the COVID-19



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pandemic has further overwhelmed the already struggling healthcare system of Pakistan, several precautionary steps need to be taken as follows. Previously, co-epidemics and the presence of multiple viral diseases, including dengue fever, Zika virus, chikungunya, Crimean Congo hemorrhagic fever, measles, poliomyelitis, and COVID-19 have claimed thousands of preventable lives because of insufficient preventive measures.

The COVID-19 pandemic had a great impact on the healthcare of Pakistan mainly because of high levels of financial constraints. The health budget of the country was not sufficient enough to allow hospitals and healthcare providers to afford manpower, ventilators, hospital beds healthcare professionals, and laboratory equipment. To avoid the occurrence of monkeypox or any other similar diseases in Pakistan, it is high time for health organizations to launch some awareness campaigns across the country to educate the people on how best they should protect themselves from getting infected with such diseases through observing high standards of hygiene, avoiding contacts with infected persons, isolating oneself, among other things.

If monkeypox were to spread, then the system for healthcare would be in for a huge blow. Currently, there is no diagnostic facility available in Pakistan for the virus; the health department has confirmed that samples of the virus can only be sent out to other countries if there is an emergency that would further endanger efforts to contain the virus. To prevent such a situation, physicians need to be aware of the symptoms of the disease, so that patients suspected of having the disease would be isolated as soon as possible rather than providing the patient with symptomatic treatment. Hospitals should be prepared with isolation facilities to attend to such patients early enough to avoid an outbreak of the virus. Further, adequate surveillance systems should be put in place to detect the cases and respond accordingly.

Pakistan currently receives a large number of flights coming from areas where monkeypox is prevalent. Screening for the virus should therefore be required at airports to reduce the chances of spread of the virus. Third, anyone with suspected or confirmed disease should self-isolate for the prodromal period to reduce transmission. To avoid the probable outbreak, we suggest that healthcare design committees should begin to formulate contingency measures during the planning stage. There is a need to come up with a strategy that focuses on close contact settings such as families, classes, and childcare centers in that they may act as reservoirs of disease transmission. In addition, the government should put in place a well-coordinated program to protect the country from future economic, business, and commercial losses that may be occasioned by such unfortunate incidents. These measures can be taken to prevent the spread of the disease and protect the population while at the same time maintaining the functioning of the economy.

Methodology

Study Design

A cross-sectional, self-administered questionnaire was developed using Google Forms. This method ensures that data is collected from a diverse population of participants within a short time thus enabling easy analysis of the topic. The survey is specific in asking questions that will help in the acquisition of data and Google Forms helps in the collection of the results.



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Study Duration

The study took place from August to October 2024.

Sample selection

The target population in this research was the residents of Karachi and Pakistan. To do this, we used probability sampling techniques to ensure that the participants recruited were from different neighborhoods across the different socio-economic statuses. This approach not only improves the credibility of our results but also emphasizes our desire to include all stakeholders in the community in our research.

Questionnaire Development

The questionnaire included the following sections: basic demographic data, general information about monkeypox, perceptions of monkeypox, and behaviors associated with the virus.

Data Collection

Google Form links were posted on social media pages such as Facebook and WhatsApp and on pages related to local communities and health. All the participants provided survey responses in an anonymous manner which makes the responses anonymous and secure.

Data Analysis

Responses from the Google forms were automatically collected in a Google sheet format. Data was then transferred to statistical software SPSS for statistical analysis.

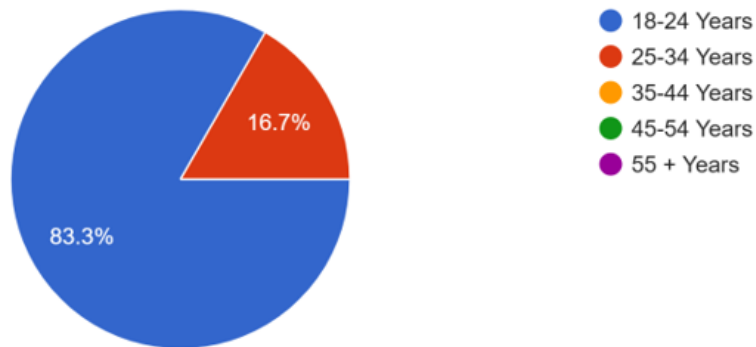
Results

To gather the data, a poll was conducted using Google Forms in Karachi from August to October 2024 where a total hundred participants responded. The poll contained several questions aimed at determining the respondents' knowledge about their illness, their experience in terms of symptoms, and prevention and treatment options. Information collected from the respondents is presented below in various tables.

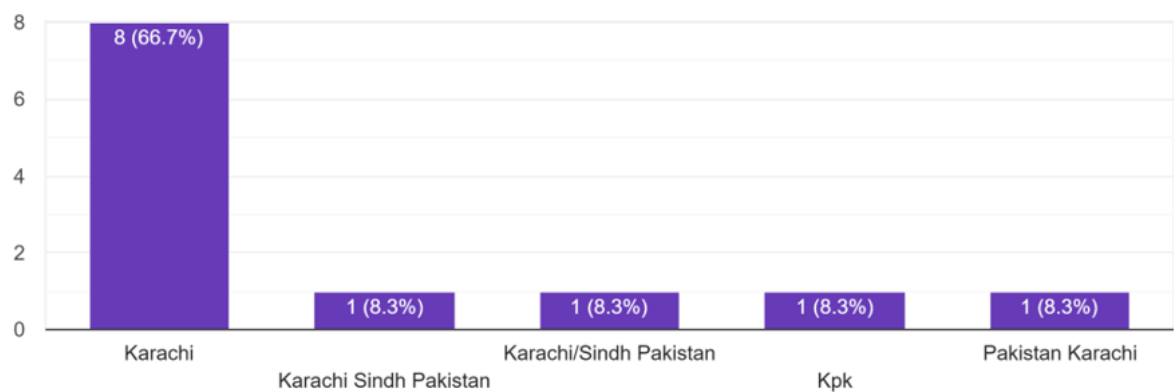
Table: Presents the Demographic Factor of Participants.



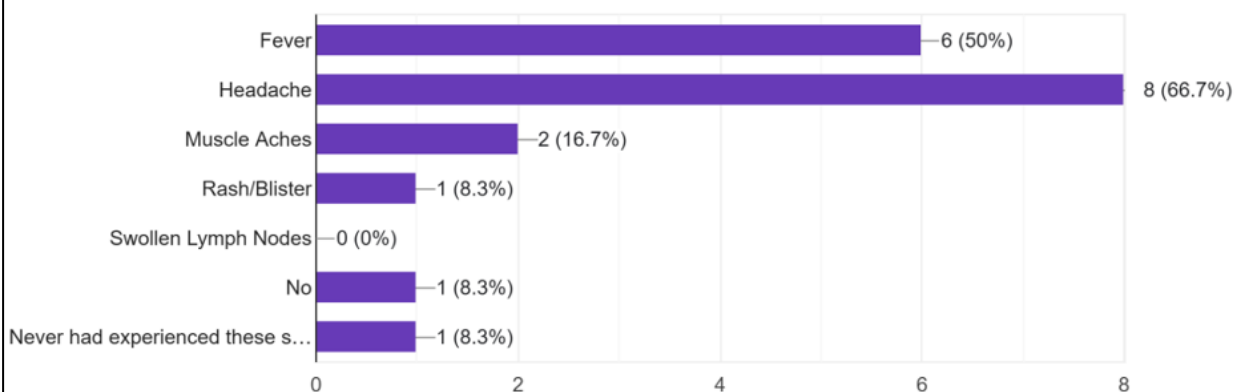
1. What is current age?



2. What is your location (city, state/province, country)?

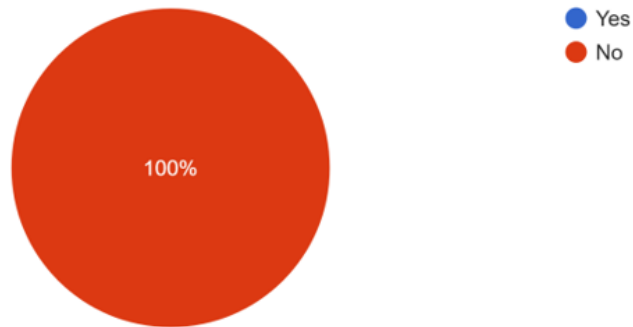


1. Have you experienced any of the following symptoms in the past 3 weeks? (Select all that apply)

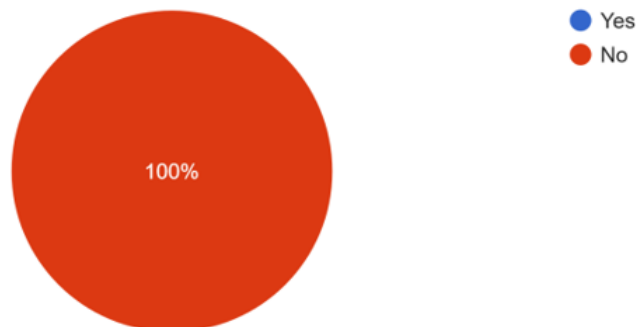




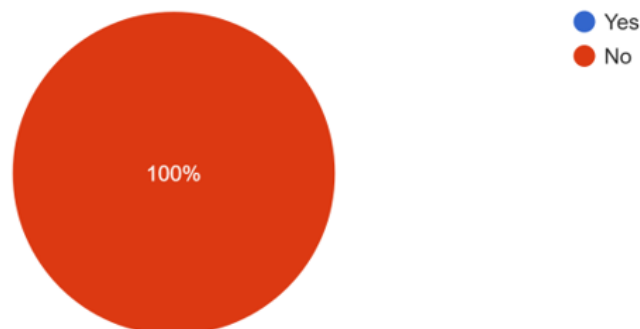
2. Have you been in close contact with someone who has monkeypox?



1. Do you have a weakened immune system (e.g., HIV/AIDS, cancer treatment)?

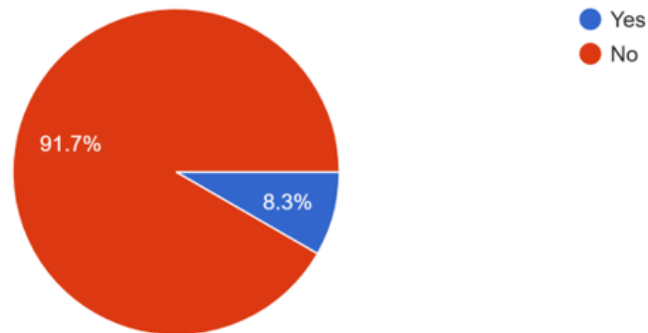


2. Have you engaged in high-risk activities (e.g., intimate contact, sharing needles)?

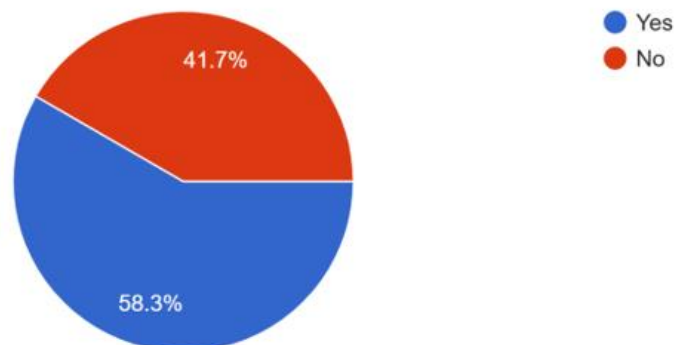




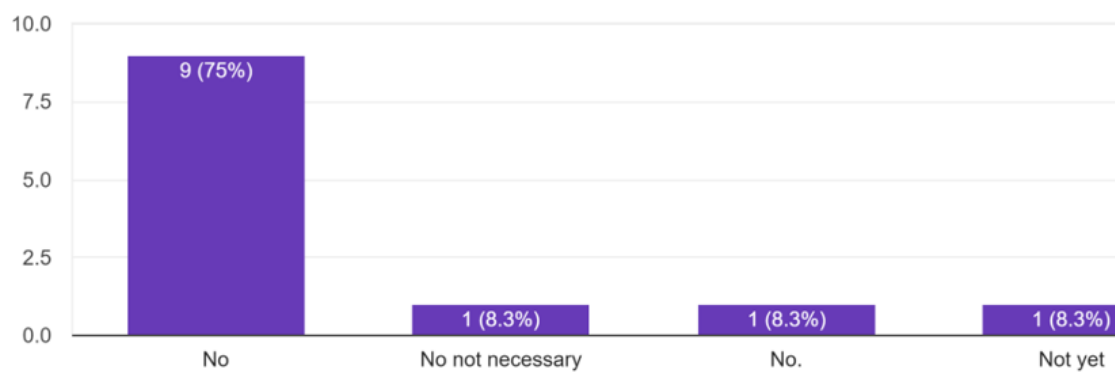
1. Have you received the monkeypox vaccine?



2. Are you interested in getting vaccinated?

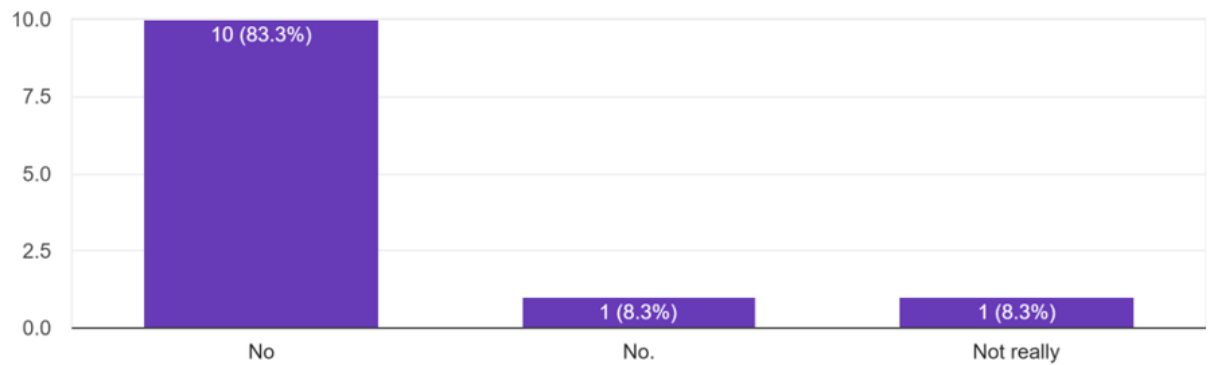


3. Have you taken any medications or treatments for monkeypox?

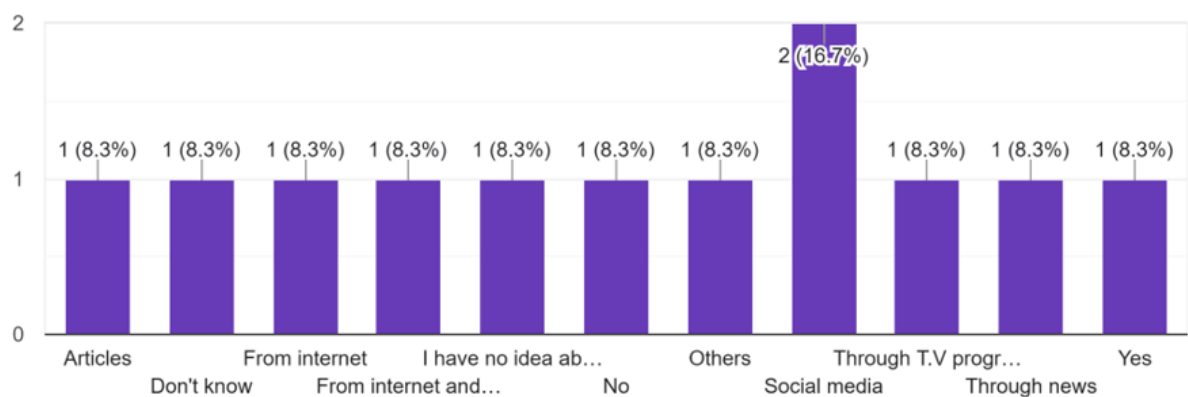




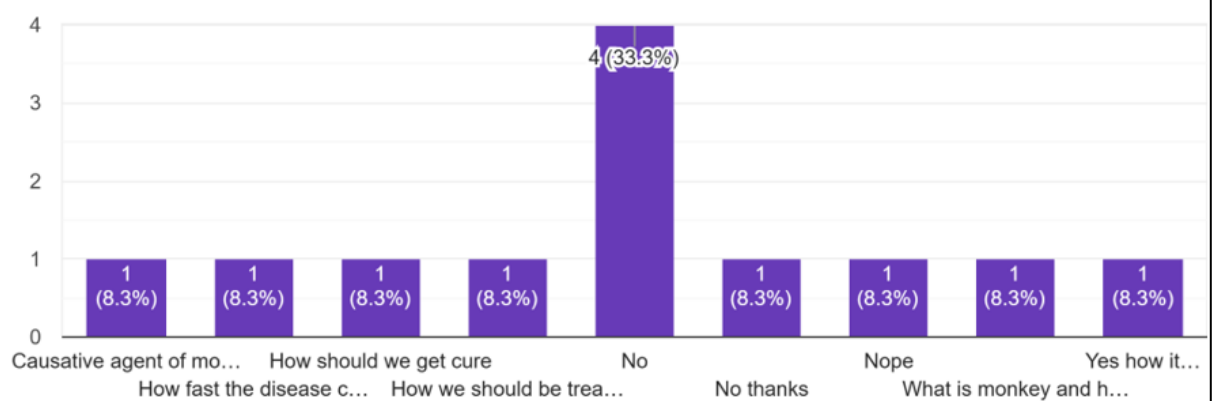
1. Do you have any underlying medical conditions?



2. How did you learn about monkeypox?



3. Do you have any questions or concerns about monkeypox?





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Prevention and Vaccination

The measures to avoid contracting the virus are; avoiding contact with animals that may be carrying the virus, washing your food and hands thoroughly, and wearing protective gear when handling infected individuals. The vaccines include Jynneos and ACAM2000, which are recommended for people with high risks such as healthcare workers and those who are exposed to animals. It is recommended that people who have not received the vaccine should avoid close contact situations and public health officials recommend that people who are traveling to regions where there is an outbreak of the disease should take a vaccine (Khan et al., 2024).

Discussion

Monkeypox, which was previously more frequently reported in Central and West Africa has extended to other parts of the world and the following trends are observable. They have been reported mostly in densely populated regions with high mobility such as cities with international travel linkages as they raise the vulnerability of exposure (Islam et al., 2023). For instance, Pakistan and the United States have identified the disease's cases primarily in major cities where it transmits through contact with people. Such urban environments enhance transmission; particularly in contexts that have poor healthcare facility access. The majority of cases confirmed so far have been among young to middle-aged men. In recent outbreaks outside Africa, men have been shown to be affected in large numbers especially where people embrace close touch (Agustí et al., 2023). However, this pattern has left researchers scratching their heads wondering what social factors may be bringing the virus to these demographics rather than any biological weakness. The poor are at a higher risk because they have poor access to, and uptake of, health care services and vaccines that play a crucial role in the prevention and suppression of infectious diseases. For example, many of the cases reported in Karachi and other provinces reveal difficulties in identifying and quarantining such patients and ensuring the public adheres to protective measures. Monkeypox is more dangerous for people with compromised immunity, like those living with HIV/AIDS, or children (Yashavardhan et al., 2023). Tracking these demographic predictors is important in the fight against disease transmission in areas of high population density and ethnically and culturally diverse cities.

Conclusion

The main purpose of the present research is to investigate the awareness of the public in Karachi, Pakistan, about monkeypox. The study aims at educating the public, especially the community on how to avoid contact with the virus by minimizing contact with animals, washing hands, and wearing protective clothing among others. Further, laboratory diagnosis and treatment are highlighted to minimize symptoms such as rash, headache, fever, and muscle pain.



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