

Knowledge, Attitude, and Perception of Anticipating 2022 Global Human Monkeypox Infection among Internal Medicine Residents at Palembang Indonesia: an Online Survey

Nelda Aprilia Salim^{1,2,*}, Indri Seta Septadina³, Mega Permata², Harun Hudari^{2,4}

¹Resident of Sp2 Internal Medicine Specialist, Division of Tropical Medicine and Infectious Disease, Faculty of Medicine Universitas Sriwijaya

²Division of Tropical Medicine and Infectious Disease, Department of Internal Medicine, Faculty of Medicine Universitas Sriwijaya, Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

³Anatomy Department, Faculty of Medicine, Universitas Sriwijaya

⁴Doctor of Medicine Program, Faculty of Medicine, Universitas Sriwijaya

Corresponding email : apriadiactor@gmail.com

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Abstract

Rapid increasing cases of Monkeypox infections in countries around the world, forcing medical professionals to be prepared to prevent it becoming the next global pandemic. We conducted the study to determine knowledge, attitude, and perception of doctors regarding preparedness for 2022 human monkeypox infection. This cross-sectional design research was conducted on 2-5 of August 2022, by circulating an online survey link to all internal medicine residents at the medical faculty of Universitas Sriwijaya, Dr. Mohammad Hoesin hospital Palembang Indonesia. The survey contained questions about the respondent's characteristics, knowledge, attitudes and perceptions about Monkeypox infection. A total of 75 residents agreed and completed the survey and were analyzed, with a mean age of 31 years, and 49 men (65.3%). Respondents' knowledge of monkeypox is not very good. Almost all respondents knew that monkeypox was transmitted by direct contact, but only 53.4% knew that monkeypox was not transmitted airborne, 34.7% not sexually, and only 18.7% answered correctly that there was no specific therapy. The percentage who answered in doubt ranged from 20-30%. Respondents' attitudes and perceptions were quite good. Almost all equipped themselves with personal protective equipment and try to find information about monkeypox by attending seminars, downloading guidelines and reading online articles. A total of 58 people (77.3%) were willing to be vaccinated against monkeypox. Residents must increase the correct knowledge about this disease in order to be able to manage appropriately if they encounter cases of monkeypox infection.

Keywords: monkeypox, doctor, knowledge

Abstrak

Kasus infeksi Monkeypox yang meningkat sangat cepat di banyak negara di dunia telah memaksa tenaga medis bersiap-siaga untuk mencegahnya agar tidak menjadi pandemi global. Kami melakukan penelitian untuk mengetahui pengetahuan, sikap, dan persepsi dokter mengenai kesiapsiagaan menghadapi infeksi Monkeypox pada manusia di tahun 2022 ini. Penelitian desain potong lintang ini dilakukan pada 2-5 Agustus 2022 dengan mengedarkan link survey secara daring pada seluruh residen penyakit dalam di fakultas kedokteran Universitas Sriwijaya RSUP Dr. Mohammad Hoesin Palembang Indonesia. Survey berisi pertanyaan tentang karakteristik responden, pengetahuan, sikap dan persepsi tentang infeksi Monkeypox. Sebanyak 75 residen bersedia dan melengkapi survey dan dianalisis, dengan rerata usia 31 tahun, laki-laki sebanyak 49 orang (65.3%). Pengetahuan sampel tentang monkeypox tidak terlalu baik. Hampir seluruh responden mengetahui transmisi monkeypox secara kontak langsung, tetapi yang mengetahui bahwa monkeypox tidak menular secara airborne hanya 53.4%, tidak secara seksual sebesar 34.7%, dan hanya 18.7% yang menjawab benar tidak ada terapi spesifik. Persentase yang menjawab ragu-ragu berkisar 20-30%. Sikap dan persepsi responden cukup baik. Hampir seluruhnya melengkapi alat pelindung diri dan berusaha mencari informasi tentang monkeypox dengan cara mengikuti seminar, mengunduh panduan dan membaca artikel daring. Sebanyak 58 orang (77.3%) bersedia divaksinasi pencegahan monkeypox. Para residen harus meningkatkan pengetahuan yang benar tentang penyakit ini agar dapat menatalaksana dengan tepat apabila menjumpai kasus infeksi monkeypox.

Kata kunci: monkeypox, dokter, pengetahuan

1. Introduction

After the world was shocked by the COVID-19 pandemic in early 2020 and is not yet finished until now, we are facing another disease that can be a threat to the global population. On July 23rd, 2022, World Health Organization (WHO) declared human monkeypox infection as a public health emergency of international concern (PHEIC). It all started when Great Britain reported a case of human monkeypox from a citizen who had a traveling history from Nigeria on May 7th, 2022. Still, in Great Britain, it was followed by a family cluster case of monkeypox that had no relation to the first case, on May 13th, 2022.¹ More reports from nonendemic countries were accepted by WHO then. Until August 7th, 2022, there are 27814 laboratory-confirmed cases of monkeypox and 11 deaths from 89 countries globally, mostly from the United States of America and European countries, reporting the highest cumulative number of cases.²

The etiology of monkeypox disease is monkeypox virus (MPXV), an Orthopoxvirus of Poxviridae family. Variola virus (causing smallpox), Vaccinia virus, and Cowpox virus are other viruses that are in the same Orthopoxvirus genus. The MPXV is 200-250 nm and has double-stranded DNA inside. It was identified for the first time in 1958 in an outbreak of monkeypox at an animal facility for polio vaccine research in Copenhagen, Denmark. Originally, it was a zoonotic infection, found mostly in Central and Western Africa. The Democratic Republic of the Congo (known as Zaire) was reporting the first case of monkeypox in humans in 1970. In 2017, Nigeria reported an outbreak of monkeypox infection in humans with 68 confirmed cases. While in Asia, Singapore was the first country to report its first case in 2019, who was a Nigerian tourist attending a conference there.^{1,3-5}

The symptoms start as a prodromal or acute phase for around 5 days. These are fever, headache, myalgia, lymphadenopathy, back pain, and fatigue. The lymphadenopathy, which

usually appears at the neck, axillary or inguinal, is one of the key differentiating factors between monkeypox and smallpox infection. At around 1-3 days after fever, the clinical manifestations are then followed by eruption of skin lesions, which are quite similar to smallpox, varicella/chicken pox, measles, syphilis, bacterial skin infection, or drug-related allergy.¹ The lesions are the evolution of maculopapular to vesicles, and pustules, then followed by crusts, found mostly in the face and extremities, but in severe cases can also be found in the whole body. In this 2022 outbreak, the lesion is also found around the genital and anal organs. The eruption is in the same phase in the body. It takes 2-4 weeks until the disease is cured.^{1,3-6}

When the study was conducted, Indonesia has not yet reported any confirmed case of monkeypox. But since the rapid increase of this disease in other parts of the world, and international travellers are permitted to enter Indonesia without quarantine procedure,⁷ the infection may spread to Indonesia soon. And as the research manuscript was in preparation, Indonesia's ministry of health announced the first monkeypox confirmed case in a 27-year-old man with travel history from abroad within a week before the symptoms developed.⁸

Palembang is one of the cities in Indonesia that has dynamic people movements, with international airports, various access to land transportation, and seaports. It has more than 5 flights a day from and to Jakarta, the city where the first monkeypox case is located at. Anticipation of monkeypox infection should be put into consideration among medical doctors, especially those working in a referral hospital since this disease was not studied during their years in medical schools. Internal medicine residents, supervised by supervisors, are usually the frontline doctors at the teaching hospital responding to this condition, like in the COVID-19 pandemic. According to WHO reports, there were 344 cases of confirmed monkeypox infection among healthcare workers, one occupational exposure has been confirmed, and the rest were being infected in

the community.² Therefore, we conducted a study to assess the knowledge, attitude, and perception toward human monkeypox infection among internal medicine residents in Palembang Indonesia.

2. Methods

This is a descriptive study. We performed a cross-sectional survey between August 2nd and August 5th, 2022 among all internal medicine residents at faculty of medicine Universitas Sriwijaya, Dr. Mohammad Hoesin general hospital Palembang Indonesia at that period time. They were asked to open a Google form link, which is distributed to the residents through the internal medicine residents' Whatsapp group, containing information about the survey and consent about study participation. The willingness to fulfill the questions was considered an agreement to participate in the study.

In the survey, no personal data were requested, such as name, email address, or any other personal data indicating to a person will not be recorded. There were 4 questions in Bahasa Indonesia about the characteristics of respondents, 7 questions about knowledge of the disease including etiology, modes of transmission, treatment, and vaccine for prevention, 3 questions about attitude and practice anticipating the disease, and 4 questions about perception. The questions were in the form of Yes – No – Doubtful choices, or multiple choices with answers. The questionnaire used was specially designed for this study and not validated because this is a pilot study. Continuous data will be presented as average, minimum, and maximum, and categorical variables were reported as percent values.

3. Results

Characteristics of respondents

The participation rate in this survey was very good. There were a total of 86 internal medicine residents during the study period, and 75 residents agreed to participate in the survey by completing the questionnaire and then analyzed. The average age of respondents was 31 years old; the minimum was 26 years old, and the maximum was 38 years old. Male was dominating with 65,3%, and female was 34.7%. Most of the respondents were in the second degree of their residency (65.3%), while at first and third degrees shared the same numbers each, 17.3%. Almost half of the respondents (49.3%) lived with their nuclear family (husband/wife, children), and the rest lived alone or with bigger family members (nuclear family plus parents or brothers/sisters, etc).

Knowledge

Before participating in this survey, 82.7% of respondents already knew that WHO has declared human monkeypox infection as a public health emergency of international concern, while 17.3% did not. All respondents knew that the etiology of monkeypox infection was a virus, but their knowledge about modes of transmission were variables. Most of the participants (53.4%) knew that monkeypox is not transmitted airborne, but unfortunately, 25.3% answered it is transmitted airborne, while 21.3% were doubtful. The majority of participants acknowledged that it is transmitted by direct contact with an infected person, but still, there were 8% who were indecisive. Regarding the potential transmission of monkeypox infection through sexual encounters, almost half of participants (49.3%) answered "yes", 34.7% answered firmly "no", and the rest were uncertain.

Table 1. The results of the survey on knowledge, attitude and perception of monkeypox infection among internal medicine residents (n=75)

Variables	n (%)
Age (year-old)	
Mean	31
Minimum – maximum	26 - 38
Sex	
Male	49 (65.3)
Female	26 (34.7)
Degree in residency	
First	13 (17.3)
Second	49 (65.3)
Third	13 (17.3)
Lived with	
Alone	17 (22.7)
With nuclear family	37 (49.3)
With nuclear family plus parents, siblings, etc	21 (28)
KNOWLEDGE	
Know that monkeypox was declared by WHO as PHEIC	
Yes	62 (82.7)
No	13 (17.3)
Etiology of monkeypox	
Virus	75 (100)
Bacteria	0 (0)
Fungus	0 (0)
Protozoa	0 (0)
Monkeypox is transmitted airborne	
Yes	19 (25.3)
No	40 (53.4)
Indecisive	16 (21.3)
Monkeypox is transmitted by direct contact with an infected person	
Yes	69 (92)
No	0(0)
Indecisive	6 (8)
Monkeypox is transmitted sexually	
Yes	37 (49.3)
No	26 (34.7)
Indecisive	12 (16)
Treatment for monkeypox	
Yes, know the medication for sure	10 (13.3)
Yes, but forget the drug's name	29 (38.7)
No treatment	14 (18.7)
Indecisive	22 (29.3)
Vaccine to prevent monkeypox	
Yes	27 (36)
No	31 (41.3)
Indecisive	17 (22.7)

<i>ATTITUDE</i>	
Preparation in anticipating monkeypox infection (multiple answers allowed)	
No preparation	6 (8)
Personal protective equipment (masks, gowns, gloves, etc)	45 (60)
Finding information about diagnosis and treatment	57 (76)
Efforts in finding information about monkeypox (multiple answers allowed)	
Attending seminars/webinars	33 (44)
Reading textbooks, journals	11 (14.7)
Downloading guidelines, but had not been read yet	37 (49.3)
Downloading and reading the guidelines	24 (32)
Read online article (like news)	34 (45.3)
Watching Youtube	1 (1.3)
Do nothing	1 (1.3)
Favor to get vaccination to prevent monkeypox	
Yes	58 (77.3)
No	2 (2.7)
Indecisive	15 (20)
<i>PERCEPTION</i>	
Monkeypox is as infectious as COVID-19	
Yes	43 (57.3)
No	12 (16)
Indecisive	20 (26.7)
Monkeypox will occur in Indonesia especially Palembang	
Yes, in the next 1 month	5 (6.7)
Yes, in the next 3 month	15 (20)
No	0 (0)
Yes, but not sure when it would happen	55 (73.3)
Which one could affect you	
Monkeypox	34 (45.3)
COVID-19	41 (54.7)
Monkeypox is "laboratory-engineered disease"	
Yes	2 (2.7)
No	64 (85.3)
Indecisive	9 (12)

When they were questioned about treatment for monkeypox infection, their answers were divided into several groups. There were 13.3% of participants answered that there is a treatment for it and they knew for sure the treatment for monkeypox infection, 38.7% knew but they did not know the certain name of the drugs, 18.7% answered that there is no treatment for it, and 29.3% were hesitant. Regarding vaccination to prevent monkeypox

infection, only 36% answered that there is a vaccine to prevent it, while the majority responded that there is no vaccine, and 22.7% were again indecisive.

Attitude

The participants were asked what they had prepared in anticipating global monkeypox infection. A small number of respondents said they made no special preparation, but the

majority tried to look for information about how to diagnose and treat monkeypox infection. Most of them also prepare themselves with personal protective equipment such as gloves, masks, gowns, etc (60%). Learning from the COVID-19 pandemic, personal protective equipment is one of the main key factors in protecting healthcare workers from suffering the infection. The efforts in finding information about monkeypox infection among participants were quite good (76%). The majority of them had downloaded from the internet guidelines released by WHO or the Indonesia Ministry of Health. Unfortunately, almost half of them had not read those guidelines (49.3%). They also followed online seminars about monkeypox infection, read textbooks, or read online free articles (44%, 14.7%, 45.3%).

Regarding their attitude toward vaccination, most participants (77.3%) were favorable to receiving vaccination to prevent monkeypox whenever ordered by the government, although we did not know whether their responses were still the same if they had to pay for it. Small numbers of participants (20%) were uncertain about vaccination, and the rest declined.

Perception

When they were asked about how infectious monkeypox is compared to COVID-19, more than half responded that they are the same. Therefore, all participants thought that Monkeypox would soon occur in Indonesia especially Palembang, although 73.3% of them were not sure when that would happen, 20% of them were sure that would happen within 3 months, while the rest thought sooner, within 1 month. But, regarding concerns about contracting the disease, 54.7% were still more worried about contracting COVID-19 than monkeypox.

In the early phase of the COVID-19 pandemic, there were misbelief and misinformation which was somehow spread by medical doctors that COVID-19 was fake, or created in a special laboratory by a pharmacy company to gain profit from selling vaccines or

medicines for it. For the final question in the survey, we also asked participants about this. Almost all respondents (85.3%) disagreed with this, 12% were not certain, but there was 1 participant who believed that monkeypox infection was laboratory engineering.

4. Discussion

As WHO director declared human monkeypox infection as PHEIC, the news was quickly distributed globally through the internet.⁹ Therefore, most respondents knew about the disease. Good knowledge is required by a medical doctor to identify monkeypox infection. In this survey, we did not ask about the clinical characteristics of monkeypox infection and how to differentiate it from other differential diagnoses, but the knowledge of respondents about the means of transmission of the disease was not good enough. Though most of them knew that it can be transmitted via direct contacts, nonetheless a quarter of them thought that it can be transmitted airborne while almost other quarters were uncertain about airborne transmission. Almost half of them even answered that it can be transmitted sexually.

Until now, human to human infection of monkeypox infection can be transmitted by close contact with droplets, body fluids, or skin lesions of an infected person. Indirect contact with contaminated household equipment such as clothes, bedsheets, towels, etc is also considered a mode of transmission.^{1,2,6} While sexual transmission is not explained as the mode of transmission. The possible reason for respondents' answers about monkeypox can be transmitted sexually is the fact that in the 2022 outbreak, most confirmed cases of monkeypox (97%) happened in gay, bisexual or men who have sex with men.^{2,6,10} The site of skin lesions was also found dominantly around anogenital area.¹⁰ Therefore, it aroused the possibility that the disease may be transmitted sexually. But until now, the sexual transmission of monkeypox among humans is not yet proved.

The close and intimate contact while doing sexual encounters or kissing is proposed as the mechanism explaining this phenomenon.^{1,2,6}

Variable answers about treatment for monkeypox among respondents can be explained because until now there is no specific treatment for it, as recommended by the WHO, the CDC, and the Indonesia Ministry of Health's guideline.^{1,2,6} But for residents who participated in the seminars about monkeypox infection held by Indonesia tropical and infectious disease experts about a week before the survey was conducted, they might answer that there is a treatment for it. From the seminar which was referencing CDC Interim clinical guidance for the treatment of monkeypox, Cidofovir has shown to be effective against Orthopoxviruses in vitro and in animal studies, but it is not known whether or not a person with severe Monkeypox infection will benefit from treatment with Cidofovir.⁶ Tecovirimat is also an antiviral medication approved by the US Food and Drug Administration (US FDA) for the treatment of smallpox in adults and children, but data about its effectiveness in treating monkeypox infections in people is not available.⁶ The number of the undecided participants, mostly from first degree residents, was almost 30% in most questions, this showed that their knowledge was not good. This showed that improving knowledge is really needed by each medical doctors.

The same condition goes with knowledge among respondents about the vaccine. There is no vaccine approved for preventing monkeypox infection. But some vaccines for preventing smallpox infection, like ACAM2000 and JYNNEOSTM were effective at protecting people against monkeypox infection. These vaccines now are recommended by The Advisory Committee on Immunization Practices (ACIP) to be vaccinated to those at risk of exposure as pre-exposure prophylaxis (PrEP).⁶

Harapan et al, reported that the level of knowledge of monkeypox among general practitioners (GPs) in Indonesia is relatively

low. His research in 2019 revealed that only 39 (9.0%) out of 432 respondents had a good knowledge of monkeypox using an 80% cutoff, while when the cutoff was reduced to 70%, 36.5% (158 out of 432) of participants had a good knowledge. Lower knowledge was associated with age over 30 years, the GPs were graduated from universities located not in Java islands, working in private clinics.³

A better knowledge of monkeypox infection were shown by Alshahrani et al. The research conducted among physician in Saudi Arabia in 2022, resulted in 219 (55%) out of 398 respondents had good knowledge, and this was associated with age under 30 years, female gender, being a general practitioner, working in the private sector, and having information of monkeypox during medical schools.⁵

As internal medicine residents, the participants showed good responses in anticipating this outbreak, by preparing their personal protective equipment and trying to improve their knowledge about monkeypox infection. Regarding their attitudes towards vaccination, most of them (77.3%) agreed to be vaccinated to prevent infection. A slightly lower response was shown by doctors in Italy, which their favorable to receive vaccination to prevent monkeypox infection was 64.4%.⁴

Because the fatality rate of monkeypox infection is not as high as COVID-19, and most of the cases reported were found in certain groups or populations, the respondents were still more worried about getting COVID-19 than monkeypox infection. The similar perception was shown among doctors in Italy. Only 32.5% of doctors perceived that monkeypox could affect them.⁴ And most participants were open-minded and did not think that monkeypox was a laboratory-engineered disease.

To the researchers' knowledge, this is the first survey conducted on doctors in Indonesia especially Palembang in responding to the 2022 global Monkeypox infection. A study assessing knowledge, attitude, and practice among general practitioners (GPs) in

Indonesia was conducted by Harapan et al, during the 2019 monkeypox outbreak.³ Other studies were conducted by Ricco et al, assessing knowledge, attitude, and practice of 2022 monkeypox infection among medical doctors in Italy,⁴ and Alshahrani et al among medical doctors in Saudi Arabia.⁵ Although our study had small numbers of sample, the survey included 86% of internal medicine residents in a major leading referral hospital in Indonesia. The limitation of the study is that the level of knowledge, attitude, and practice were not graded by objective scores, like in Harapan, et al.³ The questions in the survey also have not been validated, because this is considered a pilot study. But, it is considered good enough because all questions were understandable and answered completely. A further research with detailed questions about knowledge of monkeypox, objective scored-questions (referring to the questions in this study), and broader medical doctors population is suggested to be conducted.

5. Conclusion

The level of knowledge about monkeypox infection among internal medicine residents was not good enough. Medical doctors must prepare themselves in anticipating this outbreak by not just downloading guidelines and keeping those on their gadgets, but by reading those guidances and paying more attention to key points about the disease transmission, clinical manifestations, treatments, and preventions.

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