

Poor knowledge in Monkeypox among clinical-stage medical students: an assessment of medical student's knowledge in the epidemiology, transmission, and prevention and management options of Monkeypox in Jordan

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ABSTRACT

The worldwide spread of monkeypox has caused an urgent public health concern, emphasizing the importance of early diagnosis, appropriate clinical therapy, and precautionary



Keywords

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medical students ;
epidemiology;

measures. This study used a cross-sectional online convenience sampling survey to measure medical students' general knowledge of monkeypox in Jordan. 45 questions assessing sociodemographic information, awareness of monkeypox, and behaviors toward the disease were included in the survey that was built on previous studies. 464 medical students participated in the study, with the majority being first-year (71.1%) and female (60.3%). The main components of monkeypox, including prevention, vaccination, therapy, incubation period, and transmission, were poorly understood by students. While clinical-year students revealed better knowledge of vaccination methods and symptom management, basic-year students were more aware of regional prevalence and acute symptoms. Surprisingly, just 5% of participants had participated in monkeypox education programs, while over 70% received their information mostly from social media. The study identified significant gaps in medical students' awareness of monkeypox, highlighting the need for improved instructional materials and medical curricula to address these weaknesses. Strengthening medical students' weaknesses of monkeypox is critical given the disease's continued incidence , especially in the Middle East.

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Introduction

A DNA virus belonging to the Orthopoxvirus genus is the cause of the zoonotic disease monkeypox [1]. In unvaccinated contacts, it manifests as vesicular-pustular lesions and has a 10% recurrence rate. Between 1% and 11% of people die, and survivors may be scarred [2]. The earliest bearers, macaque monkeys, inspired its name [3]. There are two virus clades, Congo Basin (CB) and West African (WA), with WA being less contagious and virulent [1].

The first incidence of monkeypox was documented in Western and Central Africa in 1971 [5] after it was initially identified in Denmark in 1958 [4]. These areas have recorded the majority of incidents. Although it is not endemic In those areas, the virus started to spread to more than 30 countries worldwide in May 2022 [6, 7].

The last time monkeypox epidemics occurred outside of Africa was in 2003. The conditions in 2020–2022 are similar to those in the early stages of the COVID-19 pandemic. These two



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viral entities share characteristics, such as rapid cross-border dissemination and the possibility of airborne transmission [8]. 86,930 confirmed cases and 1,051 suspected cases were recorded worldwide between May 2022 and May 2023, with 116 fatalities. The majority of cases happened in nations with no history of monkeypox or connections to West or Central Africa [9]. In June 2024, it was designated a public health event of global concern [10].

Direct contact with Infected animals or human exposure to contaminated wounds, fluids, or respiratory droplets are the main ways that the monkeypox virus is transmitted [3]. Close personal contact, such as kissing, touching, and sexual contact, can also spread the disease [5, 11]. According to a WHO report, medical students' Ignorance is one of the obstacles to stopping the monkeypox outbreak. According to research, there is a lack of public knowledge about monkeypox, specifically regarding its symptoms, epidemiology, and therapies. According to a number of studies, Jordanian students, medical professionals, and the public lacked adequate understanding about the disease and harbored conspiracy beliefs, which made it difficult to respond to an outbreak after the country's first case was reported In September 2024 [12, 13, 14].

Given their active participation In the community, this study intends to evaluate medical students' knowledge and attitudes regarding monkeypox. Since a future outbreak can highlight current knowledge and training shortcomings, the study's findings to improve preparedness locally and globally. According to this viewpoint, The goal is to find loopholes before the disease spreads

Additionally, this study can shed light on how well Jordan's present educational program handles newly emerging Infectious diseases. By teaching medical students about these illnesses, we also seek to lessen the stigma attached to them.

Method

2.1. Design of Study

Students from a variety of public and private medical schools In Jordan, including Jordan University, Jordan University of Science and Technology, Al-Balqa Applied University, Yarmouk University, Mutah University, Hashemite University, Ibn Sina University for Medical Sciences, and Aqaba Medical Sciences University, were the focus of this cross-sectional online study which intends to evaluate medical students' knowledge and attitudes regarding monkeypox. Since a future outbreak can highlight current knowledge and training shortcomings, the study's findings to improve preparedness locally and globally. According to this viewpoint, The goal is to find loopholes before the disease spreads. From September 30 to October 27, 2024, the study was carried out.

2.2. Data Collection Tool and Procedure

Data was gathered using a closed-ended, anonymous, structured, and verified questionnaire. The writers verified the questionnaire's content validity. To ensure participant clarity, the questionnaire was offered in both Arabic, which is spoken in the Arab world, and English, which



is the language of teaching for medical students. The survey was modified from several other research projects [15,16,17,18]. Social media sites like Facebook, Instagram, WhatsApp, and Telegram were used for its distribution. A consent form, sociodemographic information, an evaluation of MPXV knowledge, and beliefs about MPXV were the four parts of the questionnaire. A permission form detailing anonymity, confidentiality, voluntary participation, and a succinct description of the study's goals and purpose were provided in the first section.

2.3. Social and Demographic

Factors The participant's gender, educational year, residence, faculty, GPA (acceptable, good, very good, and excellent), whether they had contracted COVID-19, whether they had received MPXV training, and where they found information about MPXV (social media, friends and family, research articles, or none) were all covered by the eight questions in this section.

2.4. Students' Understanding of MPXV

There were 27 questions In this section designed to gauge the students' familiarity with MPXV. The answers could be "yes," "no," or "I do not know." The following categories were used to group the questions, Seven points about the historical period and regions in which MPXV was first discovered, its present geographic distribution, and its worldwide growth. Four questions about MPXV's status as a disease and how it relates to other recognized illnesses. There are eight items that cover different ways that MPXV might spread from animals to people and between people. The clinical presentation of MPXV, diagnostic methods, and preventive actions are covered in eight categories. One item examines the variety of treatments choices and methods available for people with MPXV.

2.5. Views and Perceptions Regarding MPXV

Ten Items from a prior study were included in the last portion, which was evaluated using a Likert scale (strongly disagree, disagree, neutral, agree, highly agree, I don't know) [15]. This section assessed participants' attitudes about learning more about travel medicine, re-emerging infectious illnesses, and the monkeypox virus itself, as well as their views on the likelihood of controlling the virus globally. Respondents were expected to finish the entire survey before submitting it to reduce non-response bias.

2.6. Calculating Sampling and Sample Size

Medical students were recruited using a convenience sample technique. Using a 50% response distribution, a 95% confidence interval, and a 5% margin of error, the sample size was determined using the Raosoft online sample size calculator [19]. With an estimated 23,000 medical students enrolled in Jordan, a minimum sample size of 378 participants was determined to be necessary. In spite of this, 464 responses were included in this study.

2.7. Analysis of Statistics

The software Jamovi (The Jamovi Project, 2024, Version 2.6.13, <https://www.jamovi.org>) was used to analyze the data. The relationship between students' academic performance, academic stage (basic or clinical), and their understanding of the history, epidemiology, transmission, prevention, and management choices of monkeypox was investigated using



Pearson's chi-square test. A p-value of less than 0.05 was deemed significant after the test assumptions were examined. To illustrate the findings, descriptive statistics such as counts and percentages were provided in text, Tables, and figures.

2.8. Taking Ethics into Account

The Scientific Research Committee of Al-Balqa Applied University's Faculty of Medicine gave Its approval to the current study (Reference number: 2426/2/3/26). All participants gave their Informed consent, and the opening page of the questionnaire included a clear description of the study's goals. To protect the privacy of the participants, the survey responses were gathered anonymously and no personally identifiable information was obtained.

After analyzing the data, the following results were seen. The total number of participants was 464, the majority of whom were females (n = 280, 60.3%). Most of the participants were basic-years students (n = 330, 71.1%), and only 24 (5.2%) received training programs about Monkey pox. Table 1 further demonstrates the demographics of participants.

Table 1: Demographics

Frequencies of Gender

	Counts	% of Total
Female	280	60.30%
Male	184	39.70%

Frequencies of From which university in Jordan

	Counts	% of Total
Al-Balqa Applied University	274	59.10%
Hashemite University	32	6.90%
Jordanian University	36	7.80%
Mutah University	30	6.50%





Yarmouk University 23 5.00%

Ibn Sina university for medical science 28 6.00%

Aqaba medical sciences university 10 2.20%

Jordanian University of Science and Technology 31 6.70%

Frequencies of Place of Residency

	Counts	% of Total
Ajloun	6	1.30%
Amman	212	45.70%
Aqaba	5	1.10%
Balqa	74	15.90%
Irbid	63	13.60%
Jerash	15	3.20%
Karak	19	4.10%
Madapa	11	2.40%
Mafraq	7	1.50%



Ma'an	2	0.40%
Tafilah	1	0.20%
Zarqa	49	10.60%

Frequencies of Educational year

	Counts	% of Total
1st Year	31	6.70%
2nd Year	133	28.70%
3rd Year	166	35.80%
4th Year	70	15.10%
5th Year	31	6.70%
6th Year	33	7.10%

Frequencies of GPA

GPA	Counts	% of Total
Acceptable	11	2.40%
Good	119	25.60%



Very good 217 46.80%

Excellent 117 25.20%

It was concluded that the main method used by medical students to learn about Monkey pox was social media groups (n = 327, 69.6%). See Figure 1. Table 2 shows the descriptives of the student's knowledge about the history and epidemiology of monkeypox disease. Of note, there was a statistically significant difference between the students in their knowledge in the history of Monkeypox appearance, as basic year's students were more likely to say that they don't know (P = 0.007, 69.4% vs 54.5%). Unexpectedly, basic student's years had better knowledge about the prevalence of the disease in the Middle east, as they were more likely to report that its not prevalent in this region compared to the clinical stage student's (P < 0.001, 43% vs 26.9%). However, academic performance (GPA) didn't have similar association (P = 0.273). In addition, clinical stage students were more likely to report that smallpox and Monkeypox are identical (P < 0.001, 23.1% vs 7.6%), but academic performance wasn't associated with such point of view (P = 0.32). Nevertheless, no significant difference was seen in student's thoughts about the disease being reemerging based on academic stage (P = 0.53) or performance (P = 0.09). These findings show the need for re-introducing Monkeypox-related knowledge to the clinical stage students, who maybe more likely to see such cases in the near future.

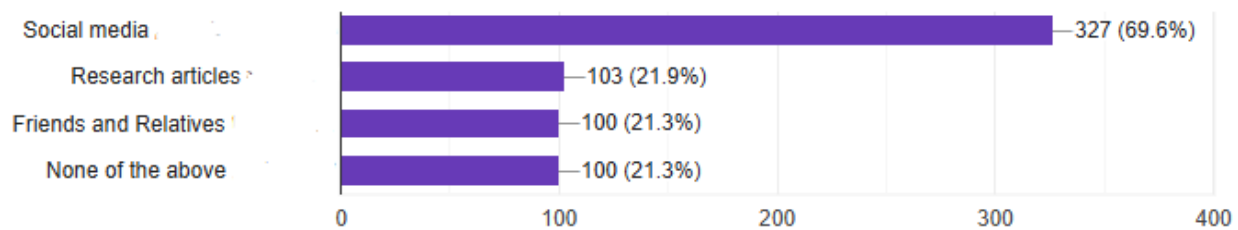


Figure 1: preferred sources for obtaining information about monkeypox among medical students

Table 2: medical students' knowledge in the history and epidemiology of Monkeypox

Frequencies of [The first time MPXV was discovered (isolated) (1958)]

	Counts	% of Total
I don't know	302	65.10%
No	20	4.30%
Yes	142	30.60%



Frequencies of [The first place MPXV was discovered (isolated) in (Africa)]

	Counts	% of Total
I don't know	159	34.30%
No	40	8.60%
Yes	265	57.10%

Frequencies of [Monkey pox is prevalent in middle eastern]

	Counts	% of Total
I don't know	153	33.00%
No	178	38.40%
Yes	133	28.70%

Frequencies of [Currently, the most affected area by MPXV (Africa) MPXV]

	Counts	% of Total
I don't know	156	33.60%
No	16	3.40%
Yes	292	62.90%

Frequencies of [MPXV and smallpox are identical diseases]

	Counts	% of Total
I don't know	153	33.00%
No	255	55.00%
Yes	56	12.10%

Frequencies of [Nowadays MPXV started to be epidemic all over the world]

	Counts	% of Total
I don't know	132	28.40%
No	94	20.30%
Yes	238	51.30%

Frequencies of [MPXV disease type (Re-emerging disease)]

	Counts	% of Total
I don't know	243	52.40%
No	41	8.80%
Yes	180	38.80%



Frequencies of [Monkeypox is considered a zoonotic disease]

	Counts	% of Total
I don't know	108	23.30%
No	21	4.50%
Yes	335	72.20%

Regarding student's knowledge in the transmission of Monkeypox, Table 3 shows their knowledge in the methods of transmission. It was noticed that only one of the items had significant association. That is, clinical stage students were more likely to say that the disease can't be transmitted via contaminated food ($P < 0.001$, 37.3% vs 20.3%). These findings are consistent with the aforementioned ones, which show the need for re-introducing Monkeypox-transmission related knowledge to the clinical stage students.

Table 3: medical students' knowledge in the transmission methodology of Monkeypox

The most common method of MPXV transmission (Contact)

	Counts	% of Total
I don't know	106	22.80%
No	31	6.70%
Yes	327	70.50%

MPXV can be transmitted vertically from mother to child

	Counts	% of Total
I don't know	240	51.70%
No	56	12.10%
Yes	168	36.20%

Monkeypox is spread through bodily fluids

	Counts	% of Total
I don't know	203	43.80%
No	45	9.70%
Yes	216	46.60%

Blood-borne transmission of the MPXV is possible

	Counts	% of Total
I don't know	200	43.10%
No	41	8.80%



Yes	223	48.10%
MPXV cannot be spread through food		
	Counts	% of Total
I don't know	214	46.10%
No	133	28.70%
Yes	117	25.20%
MPXV cannot be spread through air		
	Counts	% of Total
I don't know	176	37.90%
No	148	31.90%
Yes	140	30.20%
Monkeypox could be transmitted through a bites or scratches of an infected animal		
	Counts	% of Total
I don't know	157	33.80%
No	26	5.60%
Yes	281	60.60%

Table 4 shows medical students' knowledge in the symptomatology, prevention, and management options for Monkeypox. Of note, a statistically significant difference between the basic and clinical stage students in their knowledge of the acute symptoms of the disease, as basic stage students were more knowledgeable of acute symptoms ($P = 0.034$, 80% vs 75.4%). However, clinical stage students were more likely to correctly report the incubation period ($P = 0.036$, 49.3% vs 37.3%), were more likely to report the using of Paracetamol as a management option ($P = 0.005$, 35.8% vs 21.2%), and were more likely to report the correct period for giving the preventive vaccine post-exposure ($P = 0.027$, 31.3% vs 26.7%). All other items didn't have a significant association with the clinical stage ($P > 0.05$). Thus, clinical stage student's do have better knowledge in the management and prevention options of Monkeypox infection. However, a look at the proportions in Table 4 shows the need for improving this knowledge.

Table 4: medical students' knowledge in the symptomatology, prevention, and management options of Monkeypox

Frequencies of MPXV is a mild disease in general

	Counts	% of Total
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I don't know	141	30.40%
No	229	49.40%
Yes	94	20.30%

Frequencies The most common symptoms of MPXV (fever, rash, swollen lymph nodes)

	Counts	% of Total
I don't know	88	19.00%
No	11	2.40%
Yes	365	78.70%

Frequencies of The typical incubation period of MPXV (5 - 21 days)

	Counts	% of Total
I don't know	258	55.60%
No	17	3.70%
Yes	189	40.70%

Frequencies of A blood sample is used to confirm the diagnosis of MPXV

	Counts	% of Total
I don't know	220	47.40%
No	43	9.30%
Yes	201	43.30%

Frequencies of The most important method for preventing the spread of MPXV disease in the communities is (Avoid contact with infected individuals)

	Counts	% of Total
I don't know	84	18.10%
No	22	4.70%
Yes	358	77.20%

Frequencies of There was a licensed MPXV vaccine available at the time of this Study

	Counts	% of Total
I don't know	237	51.10%
No	117	25.20%
Yes	110	23.70%

Frequencies of One of management options for symptomatic monkeypox patients is to use paracetamol



	Counts	% of Total
I don't know	304	65.50%
No	42	9.10%
Yes	118	25.40%

Frequencies of Jordan is affected by a disease that resembles MPXV (chickenpox virus)

	Counts	% of Total
I don't know	201	43.30%
No	55	11.90%
Yes	208	44.80%

Frequencies of Smallpox vaccination provides cross protection against monkeypox

	Counts	% of Total
I don't know	237	51.10%
No	81	17.50%
Yes	146	31.50%

Frequencies of Smallpox vaccination is given within four days of exposure to prevent disease or up to 14 days after exposure to reduce the severity of the disease

	Counts	% of Total
I don't know	296	63.80%
No	38	8.20%
Yes	130	28.00%

Frequencies of MPXV can be imported to Jordan

	Counts	% of Total
I don't know	178	38.40%
No	15	3.20%
Yes	271	58.40%

Frequencies of MPXV outbreaks in 2022 were noted to be related to homosexuality

	Counts	% of Total
I don't know	267	57.50%
No	25	5.40%
Yes	172	37.10%



Medical students' had satisfactory attitudes toward the needed educational efforts to reduce the global burden and prevalence of Monkeypox, as seen in Table 5, which highlights the need for applying novel educational paths in medical schools in Jordan to better help control infectious disease transmission.

Table 5: medical students' attitudes toward educational efforts to reduce the global burden of Monkeypox

Frequencies of [I'm sure that the global population will be able to control the MPXV epidemic]

	Counts	% of Total
I don't know	16	3.40%
Strongly disagree	3	0.60%
Disagree	14	3.00%
Neutral	80	17.20%
Agree	203	43.80%
Strongly agree	148	31.90%

Frequencies of [I have negative feelings about the MPXV]

	Counts	% of Total
I don't know	17	3.70%
Strongly disagree	22	4.70%
Disagree	66	14.20%
Neutral	116	25.00%
Agree	161	34.70%
Strongly agree	82	17.70%

Frequencies of [I believe that MPXV adds additional strain on the healthcare systems of the affected countries]

	Counts	% of Total
I don't know	12	2.60%
Strongly disagree	4	0.90%
Disagree	8	1.70%
Neutral	46	9.90%
Agree	186	40.10%
Strongly agree	208	44.80%

Frequencies of [I believe that media coverage of MPXV may have an impact on its global prevention]



	Counts	% of Total
I don't know	13	2.80%
Strongly disagree	2	0.40%
Disagree	9	1.90%
Neutral	46	9.90%
Agree	147	31.70%
Strongly agree	247	53.20%

Frequencies of [I think MPXV will become a new pandemic, and its impact will be like COVID-19]

	Counts	% of Total
I don't know	19	4.10%
Strongly disagree	40	8.60%
Disagree	100	21.60%
Neutral	149	32.10%
Agree	108	23.30%
Strongly agree	48	10.30%

Frequencies of [I would like to learn more about the epidemiology of new emerging diseases]

	Counts	% of Total
I don't know	14	3.00%
Strongly disagree	4	0.90%
Disagree	10	2.20%
Neutral	51	11.00%
Agree	137	29.50%
Strongly agree	248	53.40%

Frequencies of [I believe that traveling to MPXV-infected countries is risky]

	Counts	% of Total
I don't know	13	2.80%
Strongly disagree	2	0.40%
Disagree	13	2.80%
Neutral	58	12.50%
Agree	163	35.10%



Strongly agree	215	46.30%
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Frequencies of [I believe that MPXV prevention and control measures are adequately available]

	Counts	% of Total
I don't know	24	5.20%
Strongly disagree	17	3.70%
Disagree	52	11.20%
Neutral	172	37.10%
Agree	122	26.30%
Strongly agree	77	16.60%

Frequencies of [I believe that travel medicine should be a required course during my medical school education]

	Counts	% of Total
I don't know	27	5.80%
Strongly disagree	9	1.90%
Disagree	16	3.40%
Neutral	90	19.40%
Agree	170	36.60%
Strongly agree	152	32.80%

Frequencies of [I think that MPXV can be transmitted to Jordan]

	Counts	% of Total
I don't know	16	3.40%
Strongly disagree	3	0.60%
Disagree	9	1.90%
Neutral	93	20.00%
Agree	216	46.60%
Strongly agree	127	27.40%

4. Discussion



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The potential for large epidemics makes emerging Infectious diseases like monkeypox (MPXV) increasingly important for global health. To achieve successful prevention and management, medical students, who will eventually work in healthcare, must gain a thorough awareness of these illnesses. A zoonotic illness that is mainly endemic in Africa, MPXV has lately spread to non-endemic areas, such as the Middle East. This study assesses Jordanian medical students' awareness and readiness for monkeypox, finds important gaps, and suggests practical ways to increase their preparedness. To lessen the effects of future epidemics, the findings are intended to help the improvement of medical curriculum and public health initiatives. The report also emphasizes the critical role that medical students play as the first line of defense against newly developing infectious diseases, underscoring the significance of raising awareness and readiness within this demographic.

The study found that Jordanian clinical students had a substantial lack of information about monkeypox (MPXV). For example, 65.1% of participants did not know the year that MPXV was first isolated, demonstrating a lack of regional and contextual knowledge that is essential for successful response activities. The fact that only 5.2% of students said they received regular training on MPXV further emphasizes how urgently medical school programs must adapt to fully handle new disorders. Interestingly, despite their hands-on training, clinical-year students showed less understanding of the local MPXV prevalence than foundation-year students (26% vs. 43%, $p < 0.001$). According to this pattern, students may become less interested in developing diseases as they progress through medical school or may not have access to the most recent data. Additionally, a lot of students mistakenly believed that MPXV was smallpox, which is probably because the two illnesses are similar. These results underline the need for improved educational interventions and updated training programs, raising serious worries about Jordan's future healthcare workforce's readiness to handle new health emergencies.

The disparities in data between foundation and clinical-year students suggest that the way clinical training is structured may have flaws, especially in terms of offering up-to-date and consistent instruction on newly developing infectious diseases. The necessity for focused educational programs to dispel these myths and improve knowledge of new infections is highlighted by the confusion between MPXV and smallpox. Healthcare workers may be ill-equipped to handle illnesses like MPXV if these gaps are not filled, which could provide serious public health hazards during outbreaks. This demonstrates the urgent need for changes in medical education, with a focus on incorporating current disease information into the curriculum.

In line with international studies, the study's findings highlight significant gaps in medical students' understanding of newly developing infectious illnesses, such as monkeypox (MPXV). The importance of disease-specific education was highlighted by a study carried out in Nigeria, which found that medical students had a similar lack of knowledge about MPXV symptoms, mechanisms of transmission, and preventative techniques [20]. There is a general lack of information of emerging infectious illnesses around the world, as evidenced by studies from India that showed medical students had little comprehension of the zoonotic nature of MPXV



and its epidemiological features [21]. Similar to the results of the current study, which found that 69.6% of participants cited social media as their primary source, research conducted in Europe has demonstrated that medical students regularly rely on social media for health-related information. Their reliance on non-academic venues raises questions regarding the accuracy and breadth of their knowledge [22]. Furthermore, research from South Africa highlights the need of including hands-on training in medical education. Research Indicates that hands-on workshops and simulation-based learning greatly Improve students' readiness to handle public health emergencies, filling In gaps like the ones this study identified.

The difficulties Jordanian medical students have been part of a larger global problem in medical education, as these comparisons demonstrate. In order to close these gaps, systematic curriculum modifications are required globally, with an emphasis on newly developing infectious diseases and the integration of accurate, useful, and easily available training techniques to improve student readiness. Only 36.2% of participants knew that MPXV could be passed vertically from mother to child, according to the study's findings, whereas 46.6% knew that it could be passed through body fluids. Filling such these gaps is crucial to preparing students to deal with new illness situations in the real world. Students' knowledge and preparedness for future issues have been demonstrated to be enhanced by specialized modules in current medical programs. According to our survey, 51.3% of participants knew that monkeypox has started to spread over the world. Regarding transmission, 37.1% linked the 2022 occurrences to homosexuality, and more than half thought it was a sexually transmitted disease. Furthermore, 36.2% were aware of maternal-fetal transmission, and 48.1% recognized blood-borne transmission. However, only 25.4% were aware of fluid therapy as a common supportive treatment, and 55.6% were unaware of the normal incubation period (5–21 days). These results are consistent with research conducted by Najim Z. Alshahrani, which found that more than half of participants thought monkeypox was spread through sexual contact [23]. Much like our findings, this study also identified gaps in our understanding of the symptoms, the Incubation period, and maternal-fetal and blood-borne transmission. Despite the significance of fluid therapy as a supportive treatment, less than half of participants knew about It. Furthermore, Ibrahim et al.'s survey of 426 medical students revealed that 77.5% of participants knew too little about the Zika virus, highlighting the general ignorance of newly developing infectious diseases of participants in our study disagreed with the notion that a COVID-19-style pandemic [24]. 60% may result from the resurgence of monkeypox. Some trends were observed among COVID-vaccinated individuals, although we did not look at secondary attack rates or fatality rates associated with monkeypox. In addition to having more awareness about COVID-19, students who had already been infected also showed a stronger understanding of other newly emerging infectious illnesses and their epidemiological traits. Furthermore, about 60% of participants did not know that avoiding human-to-human contact could significantly reduce the risk of transmission or that it is the main way that MPXV is spread. According to recent research on monkeypox epidemics in African nations, up to 10% of unprotected contacts may experience secondary transmission, with a fatality rate of 6% [25,26].



Implementing tactics like evidence-based training, group workshops, advanced learning platforms, and interdisciplinary cooperation is necessary to close these gaps. Studies on MPXV that are simulation-based can enhance critical thinking and offer practical skills. Active involvement in combating zoonotic illnesses can be facilitated by cooperative efforts with agencies such as the WHO, as the seminars held in Kenya. Additionally, by ensuring that students have access to proper information, cutting down on their dependence on dubious social media sources, advanced learning technologies such as apps and e-learning platforms can help students study. Students' knowledge can be expanded through interdisciplinary collaboration between clinical and public health resources, allowing them to comprehend the social and environmental elements of zoonotic diseases and creating a comprehensive approach.

Academic programs that include travel medicine courses can also better educate students for illnesses linked to international travel. Government-sponsored educational programs, such as focused seminars and campaigns, can support neighborhood disease prevention activities, particularly in areas that are susceptible. In order to counteract disinformation and promote prevention, government agencies and academic institutions should develop partnerships to communicate trustworthy health information through traditional and digital media. In addition to improving general awareness and readiness, extensive international cooperation can support initiatives to address new public health issues.

5. Study limitations

Despite providing insightful information, this study has a number of limitations that could influence how its conclusions are interpreted. To collect data on monkeypox, it was relied upon many references, which might have introduced diversity in the sources. Second, as the majority of responses were from Al-Balqa Applied University, it was unable to properly reach students from other universities, which affected the results. Third, the observed knowledge gaps might have been exacerbated by the scant attention this virus received in our university curricula, perhaps due to its relative rarity in the area.

6. Conclusion

Medical students showed a reasonable comprehension of the monkeypox resurgence. A student's level of knowledge about monkeypox was correlated with factors like their GPA, academic year, and previous training on the virus. The study found that although medical students knew the signs and ways to avoid monkeypox, they knew nothing about how the disease spread and only a little about the virus in general. Therefore, it is imperative that medical curricula be updated to incorporate important information about the disease and its causative agent. Students expressed hope that the system would be able to control future outbreaks of monkeypox in Jordan in spite of these knowledge gaps. Webinars, conferences, awareness campaigns, and a greater focus on infectious diseases in medical curricula are suggested as ways to bridge these gaps.



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