Study of knowledge, attitude and anxiety in Kurdistan-region of Iraqi population during the monkeypox outbreak in 2022

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Research Article

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Abstract

On July 23, the WHO declared the rapidly spreading monkeypox epidemic a Public Health Emergency of International Concern (PHEIC). This study attempted to assess the knowledge, attitude, and anxiety levels of the general population during the monkeypox outbreak. An online cross-sectional survey was conducted during the period July 27 and July 30, 2022, using a convenience sampling method. The questionnaire was adapted and developed after an in-depth review of the previous studies. A total of 510 respondents participated in this study. 277 (54.3%) were male, 233 (45.7%) were female. Participants had insufficient knowledge of MPX with a mean and SD deviation 2.096 ± 1.359, 2.576 ± 1.466, having a normal attitude toward MPX 4.031 ± 1.645. Moreover, they had anxiety problems 32.382 ± 10.094. There were significant differences in the mean rank scores of the knowledge of respondents about MPX according to their gender, marital status, religion, level of education, and place of residence, with p-values of 0.009, 0.000, 0.000, 0.000, and 0.000, respectively. Also, there were significant differences in the mean rank scores of attitudes of respondents toward MPX according to their gender, level of education, place of residence, and age, with p-values of 0.011, 0.020, and 0.000, 0.029, respectively. Lastly, there were significant differences in the mean rank score of anxiety of respondents toward MPX according to their gender, marital status, religion, level of education, and place of residence, with p-values of 0.000, 0.009, 0.000, 0.000, and 0.000 respectively. There is an urgent need to raise public awareness and manage people's emotional wellbeing.

Introduction

The global spread of monkeypox in May of 2022 has sparked widespread public concern. On July 23, the World Health Organization (WHO) declared the rapidly spreading monkeypox epidemic a Public Health Emergency of International Concern (PHEIC). The monkeypox virus (MPXV), also known as monkeypox (MPX), is a zoonotic infection that can be spread from animals to humans and human to human reported globally. It is most typically found in Western and Central Africa.

Since May 7, 2022, an alarming epidemic of MPX has been occurring across Europe, Australia, and America in people who have no proven travel ties to endemic regions. (Adler et al., 2022; Dye and Kraemer, 2022; Velavan and Meyer, 2022; Zumla et al., 2022). However, this was not predicted. As of August 7, 2022, in 88 countries, 28,220 cases were laboratory confirmed globally, with 27,875 cases reported in countries that have not historically reported monkeypox. Only 345 cases were confirmed in countries that have historically reported monkeypox. In addition, 6 deaths were reported globally. There is a discrepancy between the rate at which monkeypox is spreading and the fact that we have it, which makes prevention measures more difficult. The symptoms include fever, lymphadenopathy, headache, myalgia, back pain, and skin rash (Ahmed et al., 2022). When compared to smallpox, the most notable distinction is that monkeypox leads to lymphadenopathy. In certain cases, the skin lesions might remain for up to four weeks (Ahmed et al., 2022).

Anxiety and stress are common responses to disease outbreaks like monkeypox and other public health emergencies. The public’s uncertainty, concern, panic, and fear are understandable given that monkeypox is a re-emerging disease with severe consequences worldwide. Monkeypox research is ongoing, therefore many of the known facts are evolving, and many beliefs about the disease and its treatment persist. These misconceptions and false information about monkeypox are spreading rapidly in the era of broad social media use. As a result, they can be quite disturbing for some people. Authorities worldwide are warning the public against forwarding such messages without first verifying their legitimacy. As a result, everyone is feeling the effects of widespread anxiety and worry to varying degrees. The public's awareness and attitude are hypothesized to have a significant impact on the final mental and clinical outcomes. For this reason, researching these facets of the Kurdish population in Iraq is crucial. Another important health risk that is projected to grow steadily worse during this epidemic is that of mental disorders. Despite the public's widespread fear and panic during the monkeypox outbreak, patients, survivors, and their families face significant stigma and social isolation (Ogoina et al., 2019; Yinka-Ogunleye et al., 2019). Given the importance of the aforementioned factors, it was decided to assess and analyze the general population's knowledge, attitudes, and anxiety about monkeypox viral infection in the Kurdistan region of Iraq.

Materials And Methods

This was an online cross-sectional observational study carried out in all provinces of Kurdistan, the home province of the Iraqi population. Participants living in the Kurdistan-region of Iraq, aged 18 years or older, and understanding the content of the questionnaires were prompted to fill out the survey. The convenience sampling method was used to collect the data. The data was collected between July 27, 2022 and July 30, 2022. The sample size was computed, keeping the confidence interval at 95%, with an estimated 50% response distribution and a margin of error of 5%. The required minimum sample size was determined to be 382 individuals, with a total population of 5.2 million.

In order to guarantee a large-scale distribution and recruitment of participants. The questionnaire was administered in an online format. The online survey was administered via Google forms and was distributed via Facebook, WhatsApp, Twitter, and email lists. The questionnaire was adapted from prior published studies on monkeypox and COVID-19 (Harapan et al., 2020; Ricco et al., 2022; Roy et al., 2020), and modified to suit the current study (Supplementary File 1). Various adjustments were made according to the suggestions made by the specialists. To guarantee accurate results, the tool was translated from English to Arabic by some bilinguals using a forward-backwards method. A total of five minutes was needed to finish the questionnaire. Electronic informed consent was obtained from the participants before filling out the questionnaires. Specialists on the study team confirmed that the final survey was accurate, comprehensible, and valid in terms of its content. On the first page of the survey, the study aims were explained to all participants, and privacy and...
condentiality of the information were also ensured. The ethics committee of the University of Raparin, College of Nursing, granted ethical approval with a number (7/29/408, 03/08/2022). The present research was written in accordance with the STROBE guideline for cross-sectional studies (Supplementary File 2).

The questionnaire was divided into four main parts. The first part of the questionnaire gathered information about the sociodemographic characteristics of respondents, including age, gender, marital status, religion, level of education, and geographic distribution. For the sociodemographic variables, age was divided into four categories (18–27, 28–37, 38–47, and 48–57). The gender was coded as one for men and two for women, and the religion was coded as one for Muslims, two for Christians, and three for others. The marital status was recorded as a binary variable, with a value of one indicating single and two indicating married. The level of education was categorized into being able to read and write, middle and/or high school, bachelor's degrees, and postgraduate degrees.

The second section assessed respondents’ knowledge of monkeypox related to modes of transmission, isolation, prevention, treatment, main symptoms of the disease, source information, having heard the word "monkeypox" before 2022, and having attended lectures/discussions about monkeypox virus infection. This section is divided into two parts. Part one consists of five items which were yes and true or no and false questions, with 1 for yes and true and zero for no and false selection, and part two consists of four questions which were checkboxes to choose the correct answers. Participants were asked to knowledge items as either true or false with an additional (I don't know) option; 2 for yes; 1 for I don't know; and 0 for no selection. During the analysis, the scores are added together so that the total score is between 0 and 5 for the first part of the knowledge scale and 0 to 6 for the second part of the knowledge scale. In both sections, getting a higher score indicates better knowledge. The third part of the questionnaire consists of four questions related to the attitude of participants towards the monkeypox outbreak. This section included four items. Participants were asked to rate attitude items as either true or false with an additional (I don't know) option, 2 for true, 1 for I don't know, and 0 for false selection. If the total score is between 0 and 8, getting a higher score indicates a better attitude. The fourth part included questions related to the anxiety of participants about monkeypox viral infection. This part included nine items with a five-point Likert scale ranging from never, rarely, sometimes, often, and always. 5 for always, 4 for often, 3 for sometimes, 2 for rarely, and 1 for never selection. The total score is between 5 and 45. Getting a higher score indicates severe anxiety. Cronbach's alpha was used to calculate the internal consistency of the items. The test's reliability, as measured by Cronbach's alpha, was 0.80. Statistical analysis of the data was performed using SPSS 25.0 (Chicago, Illinois). The Shapiro-Wilk test was used to evaluate the normal distribution of the distance variables studied in this research, but none of the variables followed the normal distribution. Therefore, in the present study, non-parametric tests were used by Man Whitney in the case of two groups, the Kruskal-Wallis test was used in the case of three groups or more, and the Spearman correlation test was used for quantitative variables. Percentages and frequencies were used to describe categorical data, whereas mean rank, mean, standard deviation, and p-value were used to characterize continuous variables.

Results

The Kurdish population of Iraq was surveyed through an online questionnaire about their knowledge, attitudes, and levels of anxiety during the monkeypox outbreak. There were a total of 510 responses collected. The participants who took part in the study were 18–57 years old and originally from the Kurdistan region of Iraq. The participants in the study were limited to only those individuals who had access to the internet. According to the results of this study, even those with the lowest levels of education were able to read and understand the questions being asked. Approximately 40% of participants were holders of bachelor's degrees, with a mean age of 31.13 ± 8.59. There were 54.3% males and 45.7% were females. In the current study, the participants come from four different provinces in the Kurdistan-region of Iraq, with the most participants from Sulaymaniyah (50%), followed by Erbil, Duhok, and Halabja. Approximately 94.5% of participants were Muslim (Table 1).
Table 1: Sociodemographic characteristics of the study sample (N = 510)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18–27</td>
<td>204</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>28–37</td>
<td>186</td>
<td>36.5</td>
</tr>
<tr>
<td></td>
<td>38–47</td>
<td>84</td>
<td>16.5</td>
</tr>
<tr>
<td></td>
<td>48–57</td>
<td>36</td>
<td>7.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>277</td>
<td>54.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>233</td>
<td>45.7</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>240</td>
<td>47.1</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>270</td>
<td>52.9</td>
</tr>
<tr>
<td>Religion</td>
<td>Islam</td>
<td>482</td>
<td>94.5</td>
</tr>
<tr>
<td></td>
<td>Christian</td>
<td>23</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Level of education</td>
<td>Able to read and write</td>
<td>31</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>Secondary and high school</td>
<td>87</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>104</td>
<td>20.4</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>204</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Master and doctoral</td>
<td>84</td>
<td>16.5</td>
</tr>
<tr>
<td>Residence area</td>
<td>Sulaymaniyah</td>
<td>255</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Erbil</td>
<td>118</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Duhok</td>
<td>70</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Halabja</td>
<td>67</td>
<td>13.1</td>
</tr>
</tbody>
</table>

Part I: Knowledge about the monkeypox outbreak

The results of Fig. 1A shows that 70% of participants believe that monkeypox is a viral infectious disease; 81% of them have never heard of monkeypox, 92% of them have never attended a lecture or discussion about monkeypox, and 56% of the participants believe that isolating people with symptoms of the disease will stop the spread of the epidemic. On the other hand, 54% of participants believed that the virus would be transmit in more than one way. 26.7% of the participants chose more than one item as a symptom of the disease. About 62.2% of the participants selected social media as a source of their knowledge of the disease.

As shown in Table 2, there were significant differences between the mean rank scores of knowledge respondents about MPX according to their gender, marital status, religion, level of education, and place of residence, with p-values of 0.009, 0.000, 0.000, 0.000, and 0.000, respectively. However, the Spearman correlation coefficient test showed that there was a significant and indirect relationship between the mean scores of knowledge part one and their age, with a p-value of 0.001. In addition, Table 2 showed that there were no significant differences in the mean rank scores of knowledge of respondents about MPX virus according to their gender, marital status, religion, level of education, and place of residence, with p-values of 0.911, 0.700, 0.094, 0.248, and 0.148, respectively. Finally, the Spearman correlation coefficient test showed that there was a non-significant and indirect relationship between the mean scores of Knowledge Part Two and their age, with a p-value of 0.548.
The present study participants have anxiety problems with monkeypox, with mean scores of 32.38 ± 10.09, 4.03 ± 1.65, and 2.58 ± 1.47, respectively. Participants' attitudes toward monkeypox were normal, with mean scores of 237.35 ± 10.09. Finally, the results show that there was a significant and indirect relationship between the mean scores of attitudes and their age, with a p-value of 0.029.

As shown in Table 2, there were significant differences in the mean rank scores of attitudes of respondents toward MPX according to their gender, level of education, and place of residence, with p-values of 0.011, 0.020, and 0.000, respectively. In addition, the Spearman correlation coefficient test showed that there was a significant and indirect relationship between the mean scores of Knowledge Part One and gender, marital status, religion, level of education, and place of residence, with p-values of 0.000, 0.020, 0.000, 0.000, and 0.000, respectively. However, the Spearman correlation coefficient test showed that there was a non-significant and indirect relationship between the mean scores of Knowledge Part One and age, with a p-value of 0.147. Moreover, Table 3 showed that the participants’ knowledge of monkeypox in both parts is low, with mean scores of 2.096 ± 1.359, and 2.576 ± 1.466, respectively. Participants’ attitudes toward monkeypox were normal, with mean scores of 4.031 ± 1.645. Finally, the results show that the present study participants have anxiety problems with monkeypox, with mean scores of 32.382 ± 10.094.
COVID-19 on this portion of the population. As Yoo (Yoo et al., 2022) among people, the attitudes were not reported to be positive. The rather low attitude of the participants indicates the adverse and preconceived effects of the disease. The results showed that participants held neutral attitudes towards monkeypox. Although monkeypox has not spread across the world, the disease is a re-emerging disease in the world, that is, it emerges here and there every now and then. Although the pandemic seems to be recent, knowledge of the disease by ordinary people can help prevent its development. Our results coincide with previous research (Harapan et al., 2020), the disease is a re-emerging disease in the world; that is, it emerges here and there every now and then. Although the pandemic seems to be recent, knowledge of the disease by ordinary people can help prevent its development. Our results coincide with previous research not only among ordinary people, but among Jordanian medical, nursing, dentistry, and pharmacy students (Sallam et al., 2022), Indonesian general practitioners (Harapan et al., 2020), Saudi physicians (Alshahrani et al., 2022), and Italian physicians (Ricco et al., 2022). These groups of the human population are considered to be knowledgeable as they belong to the health sciences and should possess information at least regarding health-related topics. This highlights the recency of the disease, not in terms of its origin, but rather in terms of its reappearance. A dearth of knowledge concerning the transmission, treatment, and symptoms can negatively affect the control of the disease. Therefore, raising the population's level of knowledge and awareness is suggested to successfully prevent the disease from spreading across the world.

Moving on to the variation of knowledge based on the socio-demographic characteristics, our study demonstrated that there were highly statistically significant differences for all of them, namely age, gender, marital status, religion, level of education, and place of residence on the first part of the knowledge scale that included questions about transmission, prevention, isolation, treatment, major symptoms, and source of information. Inconsistent with previous research (Alshahrani et al., 2022; Harapan et al., 2020; Sallam et al., 2022), male participants in our study reported a higher level of knowledge compared to females. One explanation for this can be attributed to the dominant role that men have in society and that they are more or less responsible for the fatal issues facing the community. Furthermore, females frequently devote time and attention to make-up and cosmetics, as well as beauty gadgets. Additionally, married participants reported a higher level of knowledge compared to unmarried participants, which seems both logical and reasonable. Since married people have more concerns about health issues, and have more responsibility in society; as a result, they endeavor to acquire more knowledge. Muslims also reported higher levels of knowledge regarding monkeypox in comparison with Christians and other religions. That can be more or less related to Muslims being more committed to the rules of their unaltered religion. As for the level of education, people with bachelor's degrees showed the highest amount of knowledge, followed by those with master's and doctoral degrees, those with diploma degrees, those who were able to read and write, and then those who had a secondary school certificate. This result is rather confusing because the ranking order does not determine whether people with higher certificates show more knowledge or those with a lower level of education. Therefore, more research is needed to tackle the effect of education level on the amount of knowledge possessed by a certain population. Place of residence also produced expected results; people living in the culturally and socially more developed province of Sulaimaniyah demonstrated a higher level of knowledge, followed by Erbil, Duhok, and Halabja provinces. Contrary to our findings, previous research (Alshahrani et al., 2022; Sallam et al., 2022) detected no significant differences by place of residence. The division between the findings is related to the division of the variables into their components. For instance, place of residence in our study includes the different provinces, while in (Sallam et al., 2022), place of residence includes the division of the variable into someone being from the country or outside the country. Finally, age could also predict the amount of knowledge regarding monkeypox, with older people having less knowledge about monkeypox owing to the easier access that younger people have to the Internet. This result is supported in the literature by several studies (Alshahrani et al., 2022; Harapan et al., 2020). Nevertheless, the second part of the questionnaire concerning knowledge showed significant differences for none of the socio-demographic variables.

The second principal variable of the present study involved participants’ attitudes towards monkeypox, particularly towards vaccination, control of the disease, and travel safety within the country. The results showed that participants held neutral attitudes towards monkeypox. Although monkeypox has not spread among people, the attitudes were not reported to be positive. The rather low attitude of the participants indicates the adverse and preconceived effects of COVID-19 on this portion of the population. As Yoo (Yoo et al., 2022) states, “the wounds that the COVID-19 pandemic has inflicted on us are very deep and seemingly long-lasting and still affect us”. Such attitudes revealed in this study contradict previous research (Alshahrani et al., 2022; Riccò et al., 2022).

### Table 3

<table>
<thead>
<tr>
<th>Variables</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge part one</td>
<td>0.00</td>
<td>5.00</td>
<td>2.096</td>
<td>1.359</td>
<td>Having insufficient of knowledge toward MPX</td>
</tr>
<tr>
<td>Knowledge part two</td>
<td>0.00</td>
<td>6.00</td>
<td>2.576</td>
<td>1.466</td>
<td>Having insufficient of knowledge toward MPX</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.00</td>
<td>8.00</td>
<td>4.031</td>
<td>1.645</td>
<td>Normal attitude toward MPX</td>
</tr>
<tr>
<td>Anxiety</td>
<td>9.00</td>
<td>45.00</td>
<td>32.382</td>
<td>10.094</td>
<td>Having anxiety problems</td>
</tr>
</tbody>
</table>

**Discussion**

Epidemics and pandemics tend to occur at periodic intervals, i.e., they appear every now and then. Society encounters many challenges during these times. The lack of awareness frequently leads to a careless attitude, which can have an adverse effect on one's capability to respond appropriately to these challenges. The mental health of a community might be negatively influenced by the widespread effects of outbreaks and pandemics. Individuals in a community are influenced behaviorally as well as emotionally by the fear and anxiety that are associated with pandemics and epidemics. As a result, the researchers here endeavored to assess people's levels of knowledge, attitudes, and anxiety in Kurdish society.

The results of the knowledge assessment questionnaire revealed participants' knowledge gaps concerning monkeypox virus infection in both parts of the questionnaire. Put another way, the respondents were not informed about the disease, its symptoms, causes, transmission, and treatment, as well as about how to handle people with the disease. The reason why people have this relatively limited amount of information regarding the disease can be associated with the fact that the disease has not yet been reported in the Middle East, apart from a few rare cases in Lebanon and the United Arab Emirates (Alshahrani et al., 2022) and in the context of question. Additionally, the participants do not have experience with the disease and their knowledge is limited as knowledge of something can partially or partly stem from experience and the disease originates from central Africa (Sallam et al., 2022). Based on previous research (Harapan et al., 2020), the disease is a re-emerging disease in the world; that is, it emerges here and there every now and then. Although the pandemic seems to be recent, knowledge of the disease by ordinary people may help prevent its development. Our results coincide with previous research not only among ordinary people, but among Jordanian medical, nursing, dentistry, and pharmacy students (Sallam et al., 2022), Indonesian general practitioners (Harapan et al., 2020), Saudi physicians (Alshahrani et al., 2022), and Italian physicians (Ricco et al., 2022). These groups of the human population are considered to be knowledgeable as they belong to the health sciences and should possess information at least regarding health-related topics. This highlights the recency of the disease, not in terms of its origin, but rather in terms of its reappearance. A dearth of knowledge concerning the transmission, treatment, and symptoms can negatively affect the control of the disease. Therefore, raising the population's level of knowledge and awareness is suggested to successfully prevent the disease from spreading across the world.

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Participants’ attitudes towards monkeypox did not vary according to each of the demographic variables: religion and marital status, i.e., participants showed similar attitudes towards monkeypox regardless of their religion and marital status. However, their attitudes changed according to gender, education level, place of residence, and age. Males’ attitudes were more positive compared to females’ in terms of accepting people with the disease after recovery, receiving vaccination, travelling across the country, and controlling the disease. This finding supports and buttresses previous research that found males were more positive in their attitudes (Sallam et al., 2022). Despite the fact that (Riccò et al., 2022) demonstrated the contrary, i.e., insignificant results. Furthermore, education level showed that people with a bachelor's degree held more positive attitudes while people with diplomas recorded the lowest mean score. The results for attitude, similar to the knowledge domain, produced confusing results. As for place of residence, the results indicated that people from Sulaimaniyah province showed significantly more positive attitudes, followed by people from Halabja, Erbil, and Duhok. This might be associated with the adverse repercussions of COVID-19 that were more severe in Erbil, creating a sense of negativity towards pandemics. Again, age showed significant results, with younger people showing more positive attitudes. This might reflect the fact that people who have gone through old age could have more fear of death.

In the current monkeypox outbreak, most educated people have insufficient knowledge of this infection. There is an urgent need to raise public awareness and manage people's emotional wellbeing. There has been no research conducted to date that assesses how the monkeypox epidemic affected people's mental health. Researching the effects of monkeypox on people's mental health in different groups, including the general public, pregnant and lactating mothers, healthcare providers, immunocompromised patients, individuals infected with the virus, their close contacts, gay, bisexual people, and people with pre-existing psychiatric and medical problems who are at increased risk for adverse psychosocial outcomes, is crucial for developing efficient interventions for those affected.

Conclusion

In the current monkeypox outbreak, the limited knowledge of these study participants might be one reason behind the neutral attitudes expressed. Participants’ attitudes towards monkeypox did not vary according to each of the demographic variables: religion and marital status, i.e., participants showed similar attitudes towards monkeypox regardless of their religion and marital status. However, their attitudes changed according to gender, education level, place of residence, and age. Males’ attitudes were more positive compared to females’ in terms of accepting people with the disease after recovery, receiving vaccination, travelling across the country, and controlling the disease. This finding supports and buttresses previous research that found males were more positive in their attitudes (Sallam et al., 2022). Despite the fact that (Riccò et al., 2022) demonstrated the contrary, i.e., insignificant results. Furthermore, education level showed that people with a bachelor's degree held more positive attitudes while people with diplomas recorded the lowest mean score. The results for attitude, similar to the knowledge domain, produced confusing results. As for place of residence, the results indicated that people from Sulaimaniyah province showed significantly more positive attitudes, followed by people from Halabja, Erbil, and Duhok. This might be associated with the adverse repercussions of COVID-19 that were more severe in Erbil, creating a sense of negativity towards pandemics. Again, age showed significant results, with younger people showing more positive attitudes. This might reflect the fact that people who have gone through old age could have more fear of death.

Yet, another last variable of the study involves anxiety that coincided with the knowledge domain and the attitude domain, i.e., participants reported anxiety problems regarding monkeypox in terms of thinking about the disease, feeling paranoid, avoiding social contact, speaking about monkeypox, having difficulties with sleeping, being affected by posts on social media about the pandemic, and related ideas. One source of anxiety about the pandemic originates from the media, which keeps people informed and has been reporting bad news. This creates lots of concern and fear for ordinary people, particularly those who have already been affected by COVID-19 (Roy et al., 2020). As for the impact of the socio-demographic variables, the results showed significant differences for all of them, except for age. In other words, male participants were, to a greater degree, preoccupied with monkeypox. Furthermore, Muslims and people who had a bachelor's degree as well as people who belonged to Sulaimaniyah governorate were more anxious when compared to non-Muslims, and people who had other degrees as well as people who belonged to other governorates, respectively.

Although monkeypox has not been reported in the current context and little is known about its adverse effects, not only general practitioners’ and physicians’ information about it can be useful, but ordinary people’s information about it can help prevent the disease from spreading through different regions. Additionally, having obtained information about monkeypox can enhance people's attitudes, and this, in turn, might cause them to eliminate their anxiety about the disease.

Despite the fact that the present study includes a large portion of Kurdish population, it is restricted to people who have access to the Internet. People without Internet access may have significantly different knowledge, attitudes, and anxiety than those who do. Therefore, the present study's findings cannot be generalized to the whole population.

Declarations

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability Statement

The datasets used and analyzed in the current study are not publicly available due to condition on ethical restrictions. The raw data that supports the findings of this study are available from the corresponding author upon reasonable request.

Authors’ contributions:
References


Figures
Figure 1

Knowledge (a) and attitude (b) of participants about monkeypox viral infection (N= 510).
Figure 2

Anxiety related monkeypox outbreak in 2022 (N= 510).

**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- Supplementaryfile1Questionaires.docx
- STROBEchecklistcrosssectional.docx