



Knowledge, Attitudes, and Best Practices of Jordanian Population Toward Second Wave of COVID-19 Pandemic: A Community-Based Cross-Sectional Survey

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Abstract

Background: Coronavirus Disease (COVID-19) pandemic marks unprecedented challenges that require great efforts for its mitigation. However, restricted preventive measures were implemented to deal with this pandemic.

Purpose: The purpose of this study is to assess knowledge, attitude, and best practices among the Jordanian population toward the second wave of the COVID-19 pandemic.

Materials and methods: A cross-sectional design including 3,671 participants was conducted among the Jordanian population using a convenience sample.

Results: Generally, the Jordanian participants had good knowledge ($M=11.31$, $SD=3.35$), they have a positive attitude toward COVID-19 ($M=12.01$, $SD=5.05$) and they used the best practices to protect themselves against COVID-19 ($M=15.3$, $SD=3.7$) during the second wave.



The majority of study participants had good knowledge, positive attitudes, and effective COVID-19 practices.

Conclusion: The findings suggest that COVID-19 awareness activities for the less educated population should be prioritized.

Keywords: COVID-19, knowledge, practice, attitudes, safety, outbreak, the second wave.

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effective approach to breaking the chain of transmission (Gupta, Gupta, Dixit, & Kumar, 2020). Public awareness and adherence to recommendations, on the other hand, are far more important in managing and overcoming such a global crisis (Kaufman, Petkova, Bhui, & Schulze, 2020). Several international studies have identified methods for preventing, managing, and reducing the global spread of COVID-19 such as washing/disinfecting hands, maintaining a social distance of at least 12 meters, avoiding crowds, avoiding touching one's mouth/nose, and wearing appropriate masks are all still recommended (Chiu et al., 2020; Kapilashrami et al., 2022; Raymond, Thieblemont, Alran, & Faivre, 2020). Understanding a population's current level of knowledge, attitude, and best practices can aid in identifying gaps in preventive strategies and health promotion (Azlan, Hamzah, Sern, Ayub, & Mohamad, 2020).

The Jordanian Ministry of Health announced the first case in March 2020, and the number of patients quickly increased to 7,211 cases and 43 fatalities by the end of September of that year. There were 295,765 cases, 688 persons under treatment, and 3,851 people who died in January 2021 (Alqutob et al., 2020). Despite this, the Jordanian Ministry of Health began community immunization against COVID-19 in early 2021. By the first quarter of 2022, the total number of cases had risen to 1,680,179, with 13,959 deaths. The Jordanian government took several steps to prevent the virus from

Introduction

Coronavirus Disease 2019 (COVID-19) is a novel pandemic that forms a global pandemic (Bukata et al., 2022) which was firstly detected in Wuhan, China, in December 2019, and is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which has already reached pandemic proportions affecting the entire world in a short period (Ciotti et al., 2020). Despite extensive efforts to combat the pandemic situation, the number of cases detected has steadily increased since the first day after its detection (Romagnani et al., 2020). Despite the lack of curative treatment, numerous national and international research and development activities are underway to investigate an effective treatment (Lin et al., 2020; Qian et al., 2020).

Since January 2021, Jordan has been conducting successful vaccination drives (Kumar, Pandi-Perumal, Trakht, & Thyagarajan, 2021). In addition to vaccination and effective disease management, increased awareness and infection control measures, as well as other mitigation strategies like social distancing and face masks, are critical tools in COVID-19 pandemic management (Martinelli et al., 2021). Because Jordan is such a diverse country in terms of socioeconomic status, there are disparities in the availability of health resources for its citizens. The World Health Organization (WHO) praised an immediate lockdown as "tough and timely", and cluster containment as an



broad picture of prevention practices, which could help us focus our future efforts on societal readiness to comply with pandemic control measures (Kumar et al., 2021). The purpose of this study is to assess knowledge, attitude, and best practice among the Jordanian population toward the second wave of COVID-19 disease.

Materials and methods

Design

A descriptive cross-sectional study targeted all adult people living in Jordan to assess knowledge, attitude, and best practice among the Jordanian population toward the second wave of the COVID-19 pandemic. The study was conducted from February 2021 to May 2021. The data was collected by preparing an electronic questionnaire through a specialized internet website-Google form (via docs.google.com/form). This e-questionnaire enabled the participants to review and answer the questionnaires more conveniently. The prepared electronic questionnaire was embedded in an electronic attachment link and sent to participants through a social-media application (WhatsApp and Facebook). A timeframe was set for participation in filling out the questionnaire for three months. After the expiration of the period, the form was deactivated.

Sample

A convenience sampling strategy was used to collect the data for this study. All participants who met the following inclusion criteria were invited to participate in the study: (1) The participant should be more than 18 years old. The standard code of ethics as well as the requirements of XXX University's

spreading in March 2020, including a complete lockdown, the closure of schools and universities, the prohibition of social gatherings, and the regulation of international passengers (Khasawneh et al., 2020).

The cornerstone of combating COVID-19 is increasing public awareness of the virus's transmission, treatment, indications, symptoms, and consequences. Furthermore, identifying and resolving unfavorable attitudes towards COVID-19 has an important role in boosting awareness and adherence. The Jordanian government focused heavily on the population's understanding and attitudes through mass media, television, brochures, Facebook, and messages (Azlan et al., 2020).

On September 1, 2020, the first wave began and finished on January 26, 2021. It has unfortunately led to about 320,207 new cases and 4,233 fatalities. The second wave began around January 27, 2021, and COVID-19 morbidity and death rates began to rise once more. As of April 4, 2021, there have been roughly 310,666 new cases and 2,953 fatalities since the outbreak began. One of the theories for the rise in the number of illnesses and deaths is that individuals are becoming less committed to the pandemic-related precautions that have been implemented (Demirtaş-Madran, 2020). As a result, this research was carried out as a follow-up to analyze Jordanians' knowledge, attitudes, and behaviors about the COVID-19 virus's second wave. The knowledge, attitudes, and practices (KAP) regarding the COVID-19 outbreak among patients and relatives visiting a hospital, as well as the risks associated with it, will be investigated in this survey. The survey will also provide us with a



The third part of the questionnaire was to assess the best practices which contain ten questions. Participants were asked questions about the importance of hand hygiene, social distancing, crowding, and travel restrictions to assess their practices. The responses were graded on a 5-point Likert scale ranging from 1 to 5, where 1 indicates they're not doing this practice at all and 5= is extremely committed to this practice. For the correct answer, the participant got one score, but if they answered incorrectly they were getting zero scores. For knowledge, attitude, and practice items the higher the score the higher knowledge, attitude, and practices, respectively (Azlan et al., 2020; Zhong et al., 2020).

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) version 25 was used to analyze the data. For descriptive analysis, frequency, percentages, mean, and standard deviation were used to describe the demographical characteristics. To determine the mean differences between groups for selected demographical data, t-tests and Analysis of Variance (ANOVA) were used. The statistical level of significance was set at $\alpha < 0.05$.

Results

Sociodemographic Characteristics

The survey had a total of 3,699 participants. More than half of the participants were female ($n=2010$, 45.3%), who were from the age group between 30 to 45 years old. The participants were

Research Ethics Committee's Institutional Review Board were followed.

Instruments

The questionnaire had two sections: sociodemographic variables including, gender, age, marital status, if they have a child, residency place, educational level, and occupational status. The second section of the questionnaire contains knowledge, attitude, and best practices which were adapted from a Chinese study, the questionnaire is divided into three sections: (1) knowledge of COVID-19, (2) attitudes toward COVID-19, and (3) COVID-19-related practices. Nine items were used to assess knowledge of COVID-19, four items about infection's clinical manifestations, three items about transmission routes, one item about prevention strategies, and one item about treatment and control. For these questions, participants were given the option of true/ false basis, where 1 is scored for the correct answer and 0 for the incorrect or unsure answers. The total knowledge score was 9 as the maximum score and 0 as the minimum score. The Cronbach's alpha coefficient of knowledge items was 0.7, which indicates a good internal consistency (Zhong et al., 2020). The attitude components of the questionnaire had nine questions. To assess attitudes toward COVID-19, survey participants were asked questions about the danger of infection, their concerns to get the infection of COVID-19, their readiness to take the vaccine, their trust in the measures that taken by the government, the importance of isolation, their optimism about the possibility to find a treatment or vaccination against COVID-19. The answers were focused on their agreement, disagreement, or not sure about the measurement that was taken to protect them against COVID-19.



master's degrees (n=1466, 39.7%). More than half of the participants had governmental medical insurance (n=2248, 60.8%). See Table 1

mainly married (n=2233, 60.4%), and they mostly lived in rural areas (n=2023, 56.4%). Two-thirds of the participants had higher education of bachelor's and

Table 1: Demographics of the participants

Item	N	F (%)
Gender		
Male	1689	45.7
Female	2010	54.3
Age group		
18–29	1498	40.8
30–45	1541	42.0
46-60	496	13.5
> 60	124	3.4
Marital status		
Married	2233	60.4
Single	1303	35.2
Others	162	4.40
Living place		
Rural	2023	56.4
Urban	1611	43.6
Education status		
Secondary	1832	49.5
Diploma	401	10.8
Higher education	1466	39.7
Medical Insurance		
Governmental	2248	60.8
Private	426	11.5
No insurance	1025	27.7
Smoking status		
Smoker	1141	30.8
Non-smoker	2558	69.2

Notes: N= Number, F=Frequency

Knowledge Assessment of COVID-19

73.6%), and they were follow the standard precautions when they get infected with COVID-19 (n=2798, 75.6%). Most of them believe that the COVID-19 virus is airborne (n=3204, 86.7%) that spreads through coughing and sneezing. Also, they have a high-frequency percentage of the main symptoms that were developed after getting the infection

A total of ten questions were utilized to assess the level of knowledge about COVID-19 among the Jordanian population. Generally, the participants had a good level of knowledge about COVID-19 (M=11.31, SD=3.35). Around two-thirds of the participants believed that this virus is communicable (n=2724,



Table 2: Participants knowledge of COVID-19 (N=3699) such as fever and general weakness (n=3297, 87.6%). See Table 2

Item #	Knowledge Item	True F (%)	False F (%)	Uncertain F (%)
1	COVID-19 is communicable disease	2724 (73.6)	516 (13.9)	459 (12.5)
2	Did you follow the standard precaution when you get infected with COVID-19	2798 (75.6)	434 (11.7)	467 (12.7)
3	COVID-19 is airborne virus	3206 (86.7)	246 (6.7)	247 (6.7)
4	COVID-19 is spread via sneeze and cough	3204 (86.6)	238 (6.4)	257 (6.9)
5	People who get the infection of COVID-19 lose both taste and smell sensation	3267 (88.3)	201 (5.4)	231 (6.2)
6	People who get the infection of COVID-19 develop fever and general weakness	3297 (89.1)	187 (5.0)	215 (5.8)
7	Symptoms of COVID-19 differ from person to other	3242 (87.6)	240 (6.5)	217 (5.9)
8	Elderly people who get an infection of COVID-19 and have chronic diseases are more prone to have severe symptoms	3262 (88.2)	213 (5.8)	224 (6.1)
9	There were different face masks and each type has its specific use	3036 (82.1)	356 (9.6)	307 (8.3)
Mean (SD)				11.13 (3.35)

The level of differences among demographic characteristics of age groups, marital status, educational level, and medical insurance was assessed using ANOVA. The results reveal that knowledge scores were significantly different among all demographics of age, marital status, educational level, and medical insurance. See Table 3

Table 3: Demographic characteristics and knowledge score (N=3699)

Characteristics	Knowledge score (SD)	F	P
Age group	1.81 (.791)	3.63	.000
Marital status	1.70 (.724)	2.36	.001
Educational level	1.96 (1.03)	3.64	.000
Medical insurance	2.03 (1.12)	4.10	.000

Attitude Assessment toward COVID-19

The participants were asked nine questions to assess their attitude toward COVID-19 during the second wave. Generally, the participants had a positive attitude toward COVID-19 (M=15.3, SD=3.7). More than half of the participants had a positive attitude toward hand washing (n=2493, 67.4%), and wearing facemasks when they get out of their homes (n=1930, 52.2%). However, around half of the participants had a negative attitude since they believe to use the same facemasks daily when they were outside their homes (n=1927,



52.1%). Also, they had a negative attitude toward using hand rubs daily and avoiding crowded areas (n=1791, 46.5%) and (n=1812, 49%), respectively. See table 4

Table 4: Participants attitude toward COVID-19 (N=3699)

Item #	Questions	Agree F(%)	Disagree F(%)	Uncertain F (%)
1	Washing my hands frequently for protection against COVID-19	2493 (67.4)	1121 (30.3)	85 (2.3)
2	Wearing facemasks frequently outside my home	1930 (52.2)	1588 (42.9)	181 (4.9)
3	Using the same facemask daily when I went outside my home	941 (25.4)	1927 (52.1)	831 (22.5)
4	Using the hand rub frequently	1642 (44.4)	1719 (46.5)	338 (9.1)
5	Avoiding shaking the others hand to decrease the chance of getting the infection of COVID-19	1596 (43.1)	1805 (48.8)	298 (8.1)
6	Avoiding the crowded areas	1665 (45.0)	1812 (49.0)	222 (6.0)
7	Eating the vegetables rich in vitamin C to decrease the chance of getting the infection	1591 (43.0)	1872 (50.6)	236 (6.4)
8	Drinking herbals to decrease the chance of getting infection	1264 (34.2)	1863 (50.4)	572 (15.4)
9	Taking supplements to decrease the chance of getting an infection	1024 (27.7)	1359 (36.7)	1316 (35.6)
Mean (SD)				15.29 (3.66)

The level of differences among demographic characteristics of age groups, marital status, educational level, and medical insurance was assessed using ANOVA. The results show that there were significant differences in the attitude of participants toward COVID-19 and their marital status, educational level, and the presence of medical insurance $P=.001$. Table 5

Table 5: Demographic characteristics and attitude score (N=3699)

Characteristics	Attitude score (SD)	F	P
Age group	1.81 (.791)	1.89	.013
Marital status	1.70 (.724)	3.58	.000
Educational level	1.96 (1.03)	6.06	.000
Medical insurance	2.03 (1.12)	4.61	.000

Best Practices Assessment of COVID-19

Practices toward COVID-19 were assessed by asking the participants seven questions. The questions mainly focused on avoiding crowded areas, washing hands frequently, and disinfecting everything after contact such as surfaces, hands, clothes, and money. Generally, Jordanian participants perform the best practices to decrease the chance of getting infected with the COVID-19 virus (M=12.01, SD=5.05). Mostly, the participants agree upon avoiding contact the crowded areas (n=3249, 87.9%), cleaning and disinfecting the surfaces frequently (n=3308, 89.4%), avoiding touching the mouth and nose during cough and sneezing (n=3252, 87.9%) to decrease the chance of getting an infection of COVID-19. See Table 6



Table 6: Participants practices toward COVID-19 (N=3699)

Item #	Questions	Agree	Natural	Disagree
1	Avoiding contact with others to decrease the chance of getting infected with COVID-19	3249 (87.9)	257 (6.9)	193 (5.2)
2	Cleaning and disinfecting the surfaces frequently decrease the chance of getting infected with COVID-19	3308 (89.4)	199 (5.4)	192 (5.2)
3	Avoid touching the mouth and nose during cough and sneeze decrease the chance of getting infected with COVID-19	3252 (87.9)	231 (6.2)	216 (5.8)
	Avoid crowded areas to decrease the chance of getting infected with COVID-19	3332 (90.0)	205 (5.0)	162 (4.3)
4	Wearing facemask frequently outside homes decrease the chance of getting infected COVID-19	3077 (83.1)	312 (8.4)	310 (8.4)
5	Changing facemask frequently decrease chance of getting infected with COVID-19	3144 (85.0)	277 (7.5)	278 (7.5)
6	Eating foods rich in vitamin C protect against infection of COVID-19	2756 (74.5)	493 (13.3)	450 (12.2)
Mean (SD)				12.01 (5.05)

The level of differences among demographic characteristics of age groups, marital status, educational level, and medical insurance was assessed using ANOVA. The results show that there is a significantly different level between age group, marital status, educational level, and medical insurance $P < .001$. Table 7

Table 7: Demographic characteristics and practice score (N=3699)

Characteristics	Attitude score (SD)	F	P
Age group	1.81 (.791)	3.19	.000
Marital status	1.70 (.724)	2.26	.000
Educational level	1.96 (1.03)	3.24	.000
Medical insurance	2.03 (1.12)	2.79	.000

Discussion

COVID-19, it continues to pose a threat to all aspects of people's lives. The purpose of this study is to assess the level of knowledge, attitude, and best practices among the Jordanian population to establish baseline information that increased the awareness of the Jordanian population toward the most effective preventive measures of COVID-19 during the second wave of transmission. Besides, it is necessary to understand and improve

Worldwide, COVID-19 is the major public health concern, and the morbidity and mortality of the global community are dramatically increasing among the population from different regions in the world (Adjemian et al., 2021). Committed to preventive measures against the virus is still the best way to reduce and manage COVID-19 disease (Omaka-Amari et al., 2020). Despite numerous efforts by countries around the world to combat



about COVID-19. Their findings also revealed that social media was their participants' primary source of information(Alnasser et al., 2021).

Social distancing, hand washing and sanitizing, avoiding leaving the house except for necessities, avoiding shaking hands with others, touching their faces with unwashed hands, and wearing face masks in public areas were all reported to have adhered to the study participants. Most Jordanian families are multigenerational and have close social ties, so they frequently exchange visits and meetings. Handshakes are also a culturally significant behavior among Jordanians(Jung, 2020). The fact that the majority of participants distanced themselves from these behaviors suggests a positive attitude and practice that could help combat COVID-19. The current study's rates were higher than those reported in a previous survey in Saudi Arabia, which found that participants had some knowledge gaps and practiced poor hand hygiene(Quadri, Shubayr, Hattan, Wafi, & Jafer, 2018). Although it was not required during the data collection period, the majority of the participants in this study stated that they wore face masks in public places. Except for those with COVID-19 symptoms or those caring for infected people, the WHO and the Ministry of Health advised people to avoid wearing face masks at that time (Haischer et al., 2020; Liao et al., 2021). Face masks are currently required in public areas in Jordan and those who do not comply face charges(Khader et al., 2020).

The results of the study revealed that some predictors were significantly linked to the participants' COVID-19 KAP. Participants who had received personal health education had a higher level of

people's knowledge, attitude, and best practices(Azlan et al., 2020). The goal of this study was to assess the COVID-19 KAP Jordanian population. knowledge, attitude, and practices of the Jordanian population toward COVID-19. Generally, they had good knowledge, a positive attitude, and positive agreement on the best practices toward COVID-19. This result was similar to previous Saudi Arabiafindings(Alnasser et al., 2021) which demonstrate good practices and a positive attitude among their population regarding the preventive measures of the COVID-19 pandemic. However, it was higher than China's findings(Cai et al., 2021). Surprisingly, there were no differences in Knowledge, attitude, and practices toward COVID-19 based on residency area (rural or urban). This differs from previous research, which found that rural residents were more likely than urban residents to have low KAP toward COVID-19(Gupta et al., 2020). This could be related to ongoing health-related awareness campaigns via social media, mass media, and text messages. Another reason could be that all of the participants in this study had access to the Internet, making awareness information available to them regardless of where they lived. Another possibility is that the study's sample was made up entirely of educated people.

The majority of the participants used social media platforms to learn about COVID-19, which is consistent with previous research (Cai et al., 2021; Qian et al., 2020). While social media platforms make information readily available, they can also be a source of misinformation (Roosenbeek et al., 2020). A cross-sectional survey from Jeddah andSaudi Arabia discovered that two-thirds of the study participants had misconceptions



effective COVID-19 practices. The findings suggest that COVID-19 awareness activities for the less educated population should be prioritized. The elderly who have not adopted social media and technology should be included in future research.

Conflict of Interest Statement

I hereby disclose all of my conflicts of interest and other potentially conflicting interests, including specific financial interests and relationships, and affiliations relevant to NeuroQuantology Journal. I also agree that I will not use any confidential information obtained from my activities with NeuroQuantology Journal to further my own or other's financial interests.

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Date: 30-8-2022

Statement of informed consent: implied consent were taken from the participants.

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COVID-19 knowledge than others, similar to previous studies (Lin et al., 2020). Furthermore, COVID-19 knowledge increases with higher education levels (Alhammadi, 2021; Marinoni, Van't Land, & Jensen, 2020). Contrary to previous studies health-related personnel's knowledge was not significantly different from that of others. Effective COVID-19 awareness campaigns and the availability of the internet and smart devices for our study participants, making it easier for them to obtain information about COVID-19, are possible causes for this difference.

Conclusion

The majority of study participants had good knowledge, positive attitudes, and

quality and practices in higher education—using deep and surface approaches. *Education Sciences*, 11(9), 462.

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