Pakistan Journal of Life and Social Sciences
www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2024-22.2.0044

RESEARCH ARTICLE

Knowledge, Perception, and Awareness towards COVID-19 Outbreaks in Sample of Iraqi Population in Baghdad

Lubab Tarek[1*], Mohammed Mahmood Mohammed[2], Abeer Abdul-Hadi[3]

[1,2,3] Department of Clinical Pharmacy, College of Pharmacy, Mustansiriyah University, Baghdad, Iraq

ARTICLE INFO

Received: May 22, 2024

Accepted: Jul 23, 2024

Keywords

Coronavirus

Knowledge

Perception

Awareness

***Corresponding Author:**

lubab_alhamdany@yahoo.com

ABSTRACT

Coronavirus disease is a pandemic health challenge which is initially report in 2019 in China. It has bad impacted on quality of life and psycho-social health of individuals. A specific drug treatment has remained a challenge, although several drugs have been associated with improved outcomes of the disease. The study sample involved 180 participants from all age groups, gender, all educational levels and social statuses and the data was collected from the participants through designed questions that were demonstrated after existing surveys. The results of the study show the majority of the participants' age is around 19-25 years old. The educational feature of participants indicates that 36% male, 39% female were graduate (students), and 12% male and 35% female have bachelor degree. Most of the participants present with fever (89.4%), fatigue (83.3%), body ache (78.9%), dry cough (73.9%), and shortness of breath (72.2%) with other less symptoms. Regarding COVID-19 transmission pathways the results showed that (130)72.2 % for touching objects or surfaces that have been in contact with someone who has the virus. Regarding the highest level of severity of COVID-19 the results showed that it can be cured 165(91.7%) and it is highly infectious 151(83.9%). With regard to the vulnerability of the world's social, economic, and medical institutions, COVID-19 has served as a grave warning. Good public knowledge of clinical characteristics and preventive interventions was found in this investigation. But general understanding and understanding of transmission channels were lacking.

INTRODUCTION

Since December 2019, it has seen an increase in patients with fever, dry cough, normal or decreased white blood cell counts in Wuhan [1], posing the coronavirus disease 2019 (COVID-19) which is the major public health challenge due to its negative economic and social impacts [2,3].

Severe Acute Respiratory Syndrome Coronavirus–2 (SARS-CoV-2) presents a significant public health challenge [2], necessitating the development of a safe and effective vaccine to improve disease outcomes [4,5].

Fever, dry cough, anosmia, and loss of taste are common symptoms in patients with COVID-19, also diarrhea, abdominal pain, and vomiting/nausea reported in 13%, 9%, and 10% respectively [6, 7].

Various COVID-19 vaccine candidates aim to protect against infection without making individuals sick with unknown immunity duration for them [8-10].

Study design

This is a cross-sectional questionnaire designed study which was conducted for all age groups, gender (male, female), all educational levels and social statuses. The data was collected from the participants through designed questions [a re-arranged special formula in English language based on an existing questionnaire] that were demonstrated after existing surveys. (11). Firstly, it prepared in the English language and then translated into the Arabic language.

Sample and setting

The study involved 180 participants in Baghdad, utilizing electronic and direct questionnaires in Arabic and English, aiming to understand all societal segments. The questionnaire consists of two parts; part (I) involves the socio-demographics data of participants includes gender, age, status of marital, level of education, and work; part (II) involves questions related to five sections: Socio-demographic, Knowledge about COVID-19 symptoms and transmission ways, the means of transmission / spread of coronavirus (COVID-19), severity of COVID-19 and prevention measures, knowledge about contagion prevention/ precaution measures, and perceived susceptibility to COVID-19.

Statistical analysis:

Analysis of data was carried out using the available statistical package of SPSS-24 (Statistical Packages for Social Sciences- version 24) for data input and analysis. Data were inserted using excel program in which data were presented in simple measures as mean ±SD, frequency, and percentage (%). The significance of qualitative data was tested using Chi-square test with application of Yate's correction or Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.

RESULTS

1. Socio-demographic measures of the participants.

Table 1 represents the summary of socio-demographic variables. The majority of the participants' age is around 19-25 years old. The educational feature of participants indicates that 36% male, 39% female were graduate (students), and 12% male and 35% female have bachelor degree. The work-related background indicates a significant difference, since 24% male and 42% female of participants were still students, while 28% male and 38% female % of participants were employed.

Table 1: Socio-demographic data of the participants

Socio-demographic data of the Participants			
Items	**Percentage %**	**Percentage %**	**P-value**
Age group	**Male**	**Female**	
< 18	8%	7%	0.164
19- 25	31%	57%	
26-30	15%	15%	
31-40	12%	7%	
41-50	5%	7%	

51-60	5%	6%	
> 60	4%	1%	
Education			
Primary school	2%	6%	0.013
High school	19%	12%	
Graduate	36%	39%	
college	12%	35%	
Postgraduate	11%	7%	
Marital status			
Single	55%	69%	0.276
Married	23%	31%	
Divorced	0%	0%	
Widowed	2%	0%	
Work			
Student	24%	42%	0.000
Independent	7%	2%	
Employed	38%	28%	
Unemployed	6%	27%	
Retired	5%	1%	

- Data expressed as mean±SD, frequency, and percentage (%).

- Statistical test: The significance of qualitative data was tested using chi square test of association was used. Result of analysis considered not significant if (P > 0.05), *significant if (P < 0.05), and **highly significant if (P < 0.01).

2. Knowledge about COVID-19 symptoms

Table 2 provides descriptive statistics of the main variables of the questionnaire based on people's knowledge for symptoms of covid-19. Most of the participants believes that fever is the most common symptom of COVID (89.4%), fatigue (83.3%), body ache (78.9%), dry cough (73.9%), SoB (72.2%) with other less symptoms.

Table 2: Knowledge about COVID-19 symptoms

Knowledge about COVID-19 symptoms for the participants			
Items	**No. (%) (Yes)**	**No. (%) (No)**	**No. (%) (I don't know)**
Fever	161 (89.4%)	12 (6.7%)	7 (3.9%)
Rhinorea	69 (38.3%)	93 (51.7%)	18 (10.0%)
Sore throat	99 (55.0%)	61 (33.9)	20 (11.1%)
Body ache	142 (78.9%)	25 (13.9%)	13 (7.2%)
SoB	130 (72.2%)	42 (23.3%)	8 (4.4%)
Shivering	133 (73.9%)	40 (22.2%)	7 (7%)
Diarrhea	104 (57.8%)	64 (35.6%)	12 (6.7%)
Fatigue	150 (83.3%)	18 (10.0%)	12 (6.7%)
Dry cough	133 (73.9%)	40 (22.2%)	7 (3.9%)
Nasal congestion	89 (49.4%)	62 (34.4%)	29 (16.1%)
Weight loss	88 (48.9%)	70 (38.9%)	22 (12.2%)
Stomach upset	99 (55.0%)	59 (32.8%)	22 (12.2%)
Insomnia	109 (60.6%)	58 (32.2%)	13 (7.2%)
Incubation period (5-14 days)	151 (83.9%)	15 (8.3%)	14 (7.8%)
- Data expressed as frequency, and percentage (%). - Statistical test: The significance of qualitative data was tested using chi square test of association was used. Result of analysis considered not significant if (P > 0.05), *significant if (P < 0.05), and **highly significant if (P < 0.01).			

3. Means of transmission / spread of coronavirus (COVID-19)

Regarding COVID-19 transmission pathways and spread, the levels of responsiveness were demonstrated in table 3 results as: 130 (72.2 %) for touching objects or surfaces that have been in contact with someone who has the virus, 119 (66.1%) for handshaking with someone who has an active case of coronavirus, 107 (59.4 %) for coughing or sneezing near people infected with the coronavirus, 96 (53.3%) for relating to people who were in a hospital or emergency room and 113 (62.8%) go to areas / countries affected by coronavirus.

Table 3: Means of transmission / spread of coronavirus (COVID-19) for the participants

Means of transmission / spread of coronavirus (COVID-19) for the participants.			
Items	**No. (%) (Yes)**	**No. (%) (No)**	**No. (%) (I don't know)**
Sneezing or coughing close to COVID-19-infected individuals	107 (59.4%)	57 (31.7%)	16 (8.9%)
Visit nations / regions impacted by the coronavirus (COVID-19)	113 (62.8%)	47 (26.1%)	20 (11.1%)
contacting surfaces or things that have come into contact with an infected person	130 (72.2%)	29 (16.1%)	21 (11.7%)
Exchange handshakes with a person who is now experiencing COVID-19.	119 (66.1%)	40 (22.3%)	21 (11.7%)
travelling on the same aircraft as a person who has COVID-19	71 (39.4%)	82 (45.6%)	27 (15.0%)
Consuming food that has been prepared by a coronavirus-infected or exposed person (COVID-19)	84 (46.7%)	71 (39.4%)	25 (13.9%)
Take part in the transfusion of blood	44 (24.4%)	95 (52.8%)	41 (22.8%)
By making connections with individuals who were in ERs or hospitals	96 (53.3%)	69 (38.3%)	15 (8.3%)
pertaining to incidents that physicians have identified	73 (40.6%)	77 (42.8%)	30 (16.7%)

Regarding cases that were found during assessments at the points of entry into my nation	69 (38.3%)	79 (43.9%)	32 (17.8%)
- Data expressed as frequency, and percentage (%). - Statistical test: The significance of qualitative data was tested using chi square test of association was used. Result of analysis considered not significant if (P > 0.05), *significant if (P < 0.05), and **highly significant if (P < 0.01).			

4. Severity of COVID-19 and prevention measures

Table 4 results showed that the highest level of severity of COVID-19 was that it can be cured 165(91.7%) and it is highly contagious 151 (83.9%). Also results showed that the highest level of prevention of COVID-19 was that the country does not have a coronavirus vaccine 158(87.8%) and coronavirus impact is worse compared to influenza or common flu 162 (90.0%).

Table 4: Severity of COVID-19 and prevention measures for the participants

Severity of COVID-19 and prevention measures.			
Items	**Percentage % (Yes)**	**Percentage % (No)**	**Percentage % (I don't know)**
It can be cured	165 (91.7%)	3 (1.7%)	12 (6.7%)
It is highly contagious	151 (83.9%)	19 (10.6%)	10 (5.6%)
More people die from coronavirus than from influenza or tuberculosis put together.	124 (68.9%)	36 (20.0%)	20 (11.1%)
Individuals who have COVID-19 experience permanent physical injury.	85 (47.2%)	63 (35.0%)	32 (17.8%)
Your symptoms are similar to those of influenza and the ordinary cold.	149 (82.8%)	25 (13.9%)	6 (3.3%)
The coronavirus vaccine is not available in my community or nation.	158 (87.8%)	7 (3.9%)	15 (8.3%)
For the sickness, there aren't enough treatments or medications available in my community or country.	120 (66.7%)	40 (22.2%)	20 (11.1%)
My community's and my nation's hospitals have not implemented	134 (74.4%)	22 (12.2%)	24 (13.3%)

sufficient infection control procedures.			
The impact of coronavirus is greater than that of influenza or the common flu.	162 (90.0%)	8 (4.4%)	10 (5.6%)
My nation's authorities are equipped to handle the illness	152 (84.4%)	17 (9.4%)	11 (6.1%)
The health authorities in my nation or community have responded in an efficient manner.	64 (35.6%)	73 (40.6%)	43 (23.9%)
- Data expressed as frequency, and percentage (%). - Statistical test: The significance of qualitative data was tested using chi square test of association was used. Result of analysis considered not significant if (P > 0.05), *significant if (P < 0.05), and **highly significant if (P < 0.01).			

5. Knowledge about contagion prevention / precaution measures

Table 5 showed that the results about COVID-19 knowledge contagion prevention/ precaution measures reached the highest number of accurate replies such as: keep personal hygiene 169 (93.0%), Use of mask 163 (90.6%) and avoid crowded places 177 (98.3%), etc. Furthermore, the results also found that the public still cancel appointments in hospitals or doctor's offices 63 (35.0%).

Table 5: Knowledge about contagion prevention / precaution measures

Knowledge about contagion prevention / precaution measures			
Items	**Percentage % (Yes)**	**Percentage % (No)**	**Percentage % (I don't know)**
Personal hygiene	169 (93.0%)	9 (5.0%)	2 (1.1%)
Daily temperature monitoring	107 (59.4%)	46 (25.6%)	27 (15.0%)
Avoid traveling abroad.	119 (66.1%)	39 (21.7%)	22 (12.2%)
Use of mask	163 (90.6%)	11 (6.2%)	6 (3.3%)
Clean environment	155 (86.1%)	10 (5.6%)	15 (8.3%)
Stay home if it's not okay	132 (73.3%)	41 (22.8%)	7 (3.9%)
Seek medical attention if not okay	78 (43.3%)	87 (48.3%)	15 (8.3%)
Avoid crowded places	177 (98.3%)	1 (0.6%)	2 (1.1%)
Patients with COVID-19 are segregated or isolated.	173 (96.1%)	4 (2.2%)	3 (1.7%)

Check symptoms on websites	121 (67.2%)	45 (25.0%)	14 (7.8%)
Wore a cleaning cloth to wipe items that might have come into touch with a COVID-19 infected person.	177 (98.3%)	1 (0.6%)	2 (1.1%)
Avoid Asian restaurants or shops	108 (60.0%)	52 (28.9%)	20 (11.1%)
Stop schedules activities in hospitals or doctor's offices	63 (35.0%)	94 (52.2%)	23 (128%)
The primary line of treatment for coronavirus (COVID-19) is antibiotics.	102 (56.7%)	49 (27.2%)	29 (16.1%)
raw meat and other meal preparation using various knives	80 (44.4%)	62 (34.4%)	38 (21.1%)
- Data expressed as frequency, and percentage (%). - Statistical test: The significance of qualitative data was tested using chi square test of association was used. Result of analysis considered not significant if (P > 0.05), *significant if (P < 0.05), and **highly significant if (P < 0.01).			

6. Perceived susceptibility to COVID-19, affair of COVID-19, the possibility of contracting of COVID-19, attention about COVID-19 outbreak

Table 6 showed the results of perceived susceptibility to COVID-19, affair of COVID-19, the possibility of contracting of COVID-19, attention about COVID-19 outbreak.

Table 6: Perceived susceptibility to COVID-19, affair of COVID-19, the possibility of contracting of COVID-19, attention about COVID-19 outbreak

1. Perceived susceptibility to COVID-19.			
Items	**Percentage % (Yes)**	**Percentage % (No)**	**Percentage % (I don't know)**
Do you believe that the coronavirus (COVID-19) is stigmatised?	19 (10.6%)	155 (86.1%)	6 (3.3%)
I feel uneasy and worried that I might contract the coravirus (COVID19).	112 (62.2%)	49 (27.2%)	19 (10.6%)
I can't avoid the possibility of being caught by anything.	51 (28.3%)	90 (50.0%)	39 (21.7%)
Should I become infected with the coronavirus (COVID-19), it would have detrimental effects on myself and my family members.	127 (70.6%)	25 (13.9%)	28 (15.5%)
When I consider the coronavirus (COVID-19), I am upset.	93 (51.7%)	65 (36.1%)	22 (12.2%)

Problems with the coronavirus (COVID-19) will soon pass.	88(48.9%)	52 (28.9%)	40 (22.2%)
2. Perceived affair of COVID-19.			
Items	**Percentage % (Yes)**	**Percentage % (No)**	**Percentage % (I don't know)**
Fear of contracting the flu from a person who exhibits symptoms (such as fever, runny nose, cough, or sneezing)	70 (38.9%)	89 (49.4%)	21 (11.7%)
Fear of eating at restaurants (such as food courts and street vendor centres)	132 (73.3%)	41 (22.8%)	7 (3.9%)
Fear of interacting with those who have recently returned from travel	81 (45.0%)	89 (49.4%)	10 (5.5%)
Fear of go to hospital	85 (47.2%)	85 (47.2%)	10 (5.5%)

3. Perceived the possibility of contracting of COVID-19.			
Items	**strongly possible**	**not possible**	**possible**
Oneself	75 (41.7%)	15 (8.3%)	90 (50.0%)
My relatives	59 (32.8%)	14 (7.8%)	107 (59.4%)
People over 60 years	118 (65.6%)	1 (0.6%)	61 (33.9%)
Adults	96 (53.3%)	3 (1.7%)	81 (45.0%)
Children	20 (11.1%)	34 (18.9%)	126 (70.0%)
Medical services personnel	169 (93.9%)	1 (0.6%)	10 (5.6%)
Food vendors	130 (72.2%)	4 (2.2%)	46 (25.6%)
Food handlers	133 (73.9%)	2 (1.1%)	45 (25.0%)
Taxi drivers	138 (76.7%)	1 (0.6%)	41 (22.8%)
Where is the coronavirus (COVID-19) most likely to spread?			
Home	22 (12.2%)	53 (29.4%)	105 (58.3%)
Health institutions	167 (92.8%)		13 (7.2%)
Public transport	155 (86.1%)		25 (13.9%)

Markets or shops	144 (80.0%)	1 (0.6%)	35 (19.4%)
Countries impacted by the COVID-19 coronavirus	151 (83.9%)	1 (0.6%)	28 (15.6%)
4. Perceived attention about COVID-19 outbreak.			
Items	**High**	**High**	**High**
The effectiveness of coronavirus (COVID-19) therapies	29 (16.1%)	108 (60.0%)	43 (23.9%)
Probability that a significant coronavirus (COVID19) outbreak may spread from person to person in my community	55 (30.6%)	97 (53.9%)	28 (15.6%)
Fear that you or your family could contract the virus	61 (33.9%)	78 (43.3%)	41 (22.8%)
Having access to medicine or other effective treatments	32 (17.8%)	108 (60.0%)	40 (22.2%)
- Data expressed as frequency, and percentage (%). - Statistical test: The significance of qualitative data was tested using chi square test of association was used. Result of analysis considered not significant if (P > 0.05), *significant if (P < 0.05), and **highly significant if (P < 0.01).			

DISCUSSION

This study aims to assess knowledge, perception, and awareness of COVID-19 outbreaks among the Iraqi population to effectively control the disease.

The socio-demographic characteristics in table 1 revealed that knowledge among females was the highest which is compatible with Al-Ghabban study [12]. Also females, aged 18-25, were more knowledgeable, unmarried, and students, with a positive attitude, consistent with studies in the Philippines and Iran [13, 14].

According to age-related results, younger persons were less likely to embrace preventive measures, which was consistent with earlier studies that were presented [15]. Additionally, a different study found that women and older people in Malaysia were significantly more confident in the successful control of COVID-19 [16].

Additionally, as Qubais ***et al.*** [17] pointed out, the study's findings that participants had higher levels of knowledge could be explained by the fact that the majority of them held college degrees or above. Table 2 shows that the majority of patients had COVID-19 signs and symptoms, including fever, coughing, body aches, loss of taste or smell, and dyspnea. Patan ***et al.*** carried out a related investigation [18].

In relation to the COVID-19 transmission pathways (table 3), a high degree of responsiveness was shown when touching surfaces or objects that have come into contact with an infected person, as well as when coughing or sneezing close to an infected person. This is consistent with findings from Elayeh ***et al.,*** which demonstrated that the respondents were well aware of the most common ways that the disease is spread, including close contact, respiratory droplets, and touching contaminated surfaces [19].

According to Table 4, the most severe form of COVID-19 is highly contagious and curable, which is consistent with findings from another study [18]. In comparison to the participants in this study,

another study conducted at the early stages of the diseases at various locations in China, north Nigeria, and India found that the participants had less knowledge [20–23].

Additionally, table 4 demonstrated that COVID-19 is a more deadly illness than tuberculosis or influenza, which is consistent with the findings of Yaqoob ***et al*** survey [24], which examined people's knowledge and awareness of the COVID-19 outbreak. The lack of a coronavirus vaccine and the fact that the effects of coronaviruses are more severe than those of influenza or the common flu indicates that the country has the highest level of COVID-19 protection, according to the results. These findings conflict with a study by Hafidz ***et al.*** that showed knowledge is strongly correlated with attitude and knowledge, but not practices linked to preventive behavior. The study's evidence came from the announcement made by the local government (74.7%) and well-known public personalities (83.7%) [25].

Table 5 showed that the results about COVID-19 knowledge measures were high for keep personal hygiene such as: Use of mask, avoid crowded places and avoid crowded places. This matched with Van der Weerd ***et al***, reported an increased in perceived susceptibility level and public intention about the implement of preventive measures of H1N1 pandemic [26]. These previous results, public intention important to implement preventive measures increased, indicating the need for additional efforts from governmental organizations. Public figures and local government announcements were associated with preventive behavior (83.7%). [27, 28].

On the other hand in table 5 show that, most participants need knowledge about COVID-19 transmission and treatment methods. According to Khosravi study, that most participants seek infection prevention information from public health facilities, healthcare providers, and social media, which enhances public participation and implementation of precaution measures [29].

According to Table 6, this study discovered a substantial correlation between perceived COVID-19 susceptibility, risk of catching it, and awareness of the epidemic. Students at UK universities, however, did not discover any connection between awareness, chance of contracting, and perceived vulnerability. Increased attempts at social separation were a result of perceived severity [30]. Furthermore, a review by Liang et al. found that perceived vulnerability had no appreciable effect on COVID-19 preventative measures. However, considerable creative efforts to preserve social distance between individuals were prompted by perceived severity [31].

LIMITATIONS

The study suggests that knowledgeable Iraqis, particularly the elderly and rural residents, are more susceptible to COVID-19 due to limited internet access and health knowledge, necessitating multi-dimensional scaling assessment.

CONCLUSION

The study emphasizes how COVID-19 has made social, economic, and healthcare organizations more vulnerable. Although clinical features and preventive strategies are well known to the public, transmission paths are not ideal. The national response has to change.

Acknowledgments: We are thankful to Mustansiriyah University for the support in the field of medical training and research. We are thankful to everyone who participated in this study.

Funding: No other funding sources.

Ethics approval and consent to participate: Participants provided written consent, voluntary participation was assured, and confidentiality was maintained for all collected information.

REFERENCES

Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019***. N Engl J Med***. 2020;382(8):727-733.

Shereen MA, Khan S, Kazmi A, et al. COVID-19 infection: Origin. Transmission, and characteristics of human coronaviruses. ***J Advanced Res***. 2020; 24: 91-98.

Dubey S, Biswas P, Ghosh R, et al. Psychosocial impact of COVID-19. ***Diab Metab Syndr.*** 2020; 14(5):779-788.

Iheanacho CO, Okwesilieze CN. Clinical outcomes of the pharmacological management of coronavirus disease 2019 (COVID-19). ***J Basic Soc Pharm Res***. 2020; 1(Suppl 1): S1-S15.

Iheanacho CO, Eze UIH. Effects of immunomodulatory therapies on COVID-19 prognosis in moderateto-critically ill patients: A systematic review. ***J Basic Soc Pharm Res.*** 2020;1(Suppl 1):S42 – S58.

Cheung K S, Hung I F, Chan P P. Gastrointestinal manifestations of SARS-CoV-2 infection and virus load in fecal samples from the Hong Kong Cohort and systematic review and meta-analysis .***Gastroenterology*** .2020(April): S0016-50852030448–30448.

Zhang W, Du RH, Li B, et al. Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. ***Emerg Microbes Infect***. 2020; 9(1):386-389.

Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. ***The Lancet.*** 2020.

Kim JS, Choi JS. Middle East respiratory syndrome–related knowledge, preventive behaviours and risk perception among nursing students during outbreak. . ***Journal of clinical nursing***. 2016 Sep; 25(17-18):2542-9.

Al-Mohaithef M, Padhi BK. Determinants of COVID-19 vaccine acceptance in Saudi Arabia: a web-based national survey. ***Journal of multidisciplinary healthcare***. 2020 Nov 20:1657-63.

Faris SH, Athbi HA. Risk Perception and Public Attention toward COVID-19 Outbreak in Iraq. Annals of the Romanian Society for Cell Biology. 2021 May 13:15791-805.

Al-Ghabban SI. Knowledge, Attitude and Practice toward COVID-19 among Iraqi Adults in Karbala: KAP toward COVID-19 among Iraqi adults in Karbala. ***Iraq Medical Journal***. 2022 Dec 26;6(4).

Lau LL, Hung N, Go DJ, Ferma J, Choi M, Dodd W, et al. Knowledge, attitudes and practices of COVID-19 among income-poor households in the Philippines: A cross-sectional study. ***J Global Health***. 2020;10(1):011007. doi: 10.7189/jogh.10.011007

Araban M, Karimy M, Mesri M, Rouhani M, Armoon B, Koohestani HR, Shamsi M, Stein L. The COVID-19 pandemic: public knowledge, Attitudes and Practices in a central of Iran. ***Journal of Education and Community Health***. 2021 Mar 30; 8(1):35-40.

Taher TM, Al-Fadhul SA, Hassooni ZA. Community Preventive Measures Related to Coronavirus Disease-19 among Iraqi Population. ***Open Access Macedonian Journal of Medical Sciences***. 2020 Oct 28;8(T1):325-9.

NeJhaddadgar N, Pirani N, Heydarian N, Ebadi Fard Azar AA, Yazdi F, Toghroli R, Chaboksavar F, Shalchi Oghli S, Kianipour N, Zokaei A, Foroughinia A. Knowledge, attitude, and practice toward the COVID-19 infection among adults Iran: A cross-sectional study. ***Journal of public health research.*** 2022 Oct;11(4):22799036221129370.

Qubais SB, Al-Shahrabi R, Bolarinwa OA. Socio-demographic correlate of knowledge and practice toward novel coronavirus among people living in Mosul-Iraq: A cross-sectional study. ***medRxiv***. 2020 Sep 11:2020-09.

Patan SK, Chittem SD, Madithati P, Narapureddy BR, Chittooru CS, Lingala KV, Gular K. A descriptive cross-sectional study on COVID-19 knowledge, attitude, and practices of South Indian population. ***Journal of Education and Health Promotion***. 2021;10.

Elayeh E, Aleidi SM, Ya'acoub R, Haddadin RN. Before and after case reporting: A comparison of the knowledge, attitude and practices of the Jordanian population towards COVID-19. ***Plos one***. 2020 Oct 15;15(10):e0240780.

Reuben RC, Danladi MMA, Saleh DA, Ejembi PE. Knowledge, Attitudes and Practices Towards COVID-19: An Epidemiological Survey in North-Central Nigeria***. J Community Health***. 2020 Jul 7 ;1-14.

Wong CL, Chen J, Chow KM, Law BMH, Chan DNS, So WKW, Leung AWY, Chan CWH. Knowledge, Attitudes and Practices Towards COVID-19 Amongst Ethnic Minorities in Hong Kong. ***Int J Environ Res Public Health***. 2020 Oct 27;17 (21):7878.

Zhong BL, Luo W, Li HM, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online crosssectional survey. ***Int J Biol Sci***. 2020;16 (10):1745-1752.

Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. ***Asian J Psychiatr***. 2020;51:102083.

Yaqoob E, Javed S, Rehman A, Fayaz M, Babar MS, Yaqoob AN, Javed S, Rehman A, Fayaz M, Babar MS, Nasir A. Seeing COVID-19 through a Health care professional's eye. ***Journal of Rawalpindi Medical College***. 2022 Oct 26;26(2):183-184.

Hafidz F, Adiwibowo IR, Kusila GR, Oktavia A, Saut B, Jaya C, Siregar DR, Dhanalvin E, Tania I, Johana J, Ruby M. Knowledge, attitudes, and practices related to COVID-19 in Indonesia: A post delta variant wave cross-sectional study. ***Frontiers in Public Health***. 2023 Apr 13;11:1072196.

Van der Weerd, W., Timmermans, D., Beaujean, D., Oudhoff, J., and van Steenbergen, J. Monitoring the level of government trust, risk perception and intention of the general public to adopt protective measures during the influenza A (H1N1) pandemic in The Netherlands. ***BMC public health*** (2011); 11, 575. https://doi.org/10.1186/1471-2458-11-575

Ali, Wajid, Iqtidar Hussain, and Sabbor Hussain. "Covid-19: People Perception Knowledge and Experience: an Evidence from Gilgit-Baltistan Pakistan." .***International Transaction Journal of Engineering Management & Applied Sciences & Technologies*** .2021: 8-8.

Khasawneh, Ashraf I., Anas Abu Humeidan, Jomana W. Alsulaiman, Sarah Bloukh, Mohannad Ramadan, Tariq N. Al-Shatanawi, Hasan H. Awad et al. "Medical students and COVID-19: knowledge, attitudes, and precautionary measures. A descriptive study from Jordan." ***Frontiers in public health*** .8 2020: 253.

Khosravi M. Perceived risk of COVID-19 pandemic: the role of public worry and trust. Electronic . ***Journal of General Medicine***. 2020 Mar 27; 17(4).

Barrett C, Cheung KL. Knowledge, socio-cognitive perceptions and the practice of hand hygiene and social distancing during the COVID-19 pandemic: a cross-sectional study of UK university students. ***BMC Public Health***. (2021) 21:426.

Liang W, Duan Y, Li F, Rhodes RE, Wang X, Peiris DLIHK, et al. Psychosocial determinants of hand hygiene, facemask wearing, and physical distancing during the COVID-19 pandemic: a systematic review and meta-analysis. ***Ann Behav Med***. (2022) 56:1174–87. products.