International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

Knowledge, Attitude and Practices (KAP) of Health Care Workers at Benghazi hospitals, Libya about the Corona virus during (COVID19) Pandemic

Fatma Yousuf M. Ziuo**1**, Mariam Ambarak S. Busaadia**2**, Salma Mohamed Amer**3**
Amenh B. Yousif**4**, Aziza I. Kadwar**5**. Rabea gazal**6**

1,4*-Department of Family and Community Medicine, Faculty of Medicine, University of Benghazi, Benghazi,Libya.*
2,3*-Faculty of Public Health, University of Benghazi, Benghazi, Libya.*
5*-Department of Pediatrics, Faculty of Medicine, University of Benghazi, Benghazi, Libya.*
6*-Head of Immunology and Virology lab in Benghazi Children hospital, Benghazi, Libya.*

Submitted: 15-09-2021 Revised: 25-09-2021 Accepted: 28-09-2021

ABSTRACT:
Background/Aim: The coronavirus disease 2019 (COVID- 19) pandemic, also referred to as the coronavirus (CoV) pandemic, is an ongoing outbreak of COVID- 19. It is caused by severeacute respiratory syndrome CoV 2. Health- careworkers (HCWs) are at amplified risk of infection of CoV due to the nature of their work. This studyaims to evaluate the knowledge, attitude, and practice toward (COVID- 19) among Libyan HCWs.

Materials and Methods: A cross- sectional survey was carried out from the 1st of September to 31 of October 2020; data were collected through manual questionnaire.

The sample of the study was a health care worker in both hospitals, Children's Hospital and Central Medical Hospital. The number of participants was 120, they completed the questionnaire.

Results: The majority of the participants were female (85.9 %), nurses (31.8%). They have sufficient knowledge of the incubation period for the virus (87%). In this study, their main sources of information were social media (55.3%) , followed by the official government website (31.8%).In addition, they had sufficient information about the necessary precautions to avoid infection with the virus, and personal hygiene was at the forefront of precautions(98.8%) , followed by avoiding travel and the use of various means of transportation (97.6 %) (82.4%) respectively.

Conclusion: Most of the Libyan HCWs had good knowledge for virus, and the knowledge scores were significantly associated with the age difference. In addition, they had a positive attitude for COVID- 19. The findings will assist authorities to establish the essential educational programs to provide advanced learning by providing necessary recommendations and deliver the best practice to control the pandemic. Essentially, these procedures will ensure their health and safety.

Keywords: Attitude, coronavirus disease 2020, health- care workers, knowledge, Libya, practice

I. INTRODUCTION

Coronaviruses (CoVs) are a group of viruses that affect Human beings through zoonotic transmission. This novel strain in the coronavirus family, which also includes the viruses that are responsible for both SARS and Middle East respiratory syndrome (MERS), causes coronavirus disease 2019 (COVID-19) (1,2). These diseases share the symptoms of respiratory infection, such as cough and fever (3,4). However, the number of cases of COVID-19 and deaths are higher than that of SARS or MERS (3,4,5,6). About the Coronavirus (2019), it was on December 31st, 2019where the first case was reported to the WHO

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

Country Office in Wuhan, China with symptoms of unexplained low respiratory infections. On January 12, 2020, WHO found that Coronavirus was the reason for this infection in Wuhan, and later on 11th February, WHO Director-General announced this novel CoV as „COVID-19" which is an acronym of „Coronavirus disease 2019" (1,2,4). Asthe outbreak of COVID-19 expanded beyondChina, the World Health Organization (WHO) characterized it on 11th March 2020, as a pandemicdisease (7).

Globally, the United States of America has the highest affected with 695,350 cases and the highest number of deceases (32,427 deaths). While, African region is the least affected with 13,892cases and 628 deaths, but the numbers are increasing (8). Libya has so far confrmed 75 465 cases of COVID-19 as of 18th November 2020 (8).

Throughout history, hospitals all over the world have been involved in disasters, both internal and external. However, when an event resulting in a disaster involves a hospital, all patients and staff are equally at risk. The American College of Emergency Physicians (ACEP) defines a disaster as a natural or man-made force the destructive impact of which overwhelms a community's abilityto meet health care demands. Although most U.S. disasters are not considered catastrophic and result in relatively few injuries, they do occur regularly and cause extensive morbidity and damage. (9).

The Health Care Workers (HCWs) as the first line of protection and older persons were the most vulnerable to COVID-19 infection that the majority of other people (10). Throughout that time, there was also a serious deficiency of personal protective equipment given to the existing conflict and the country's unrest. Likewise, it was very important to focus on the need to understand the level of readiness of HCWs in order to manage with the outbreak of COVID-19 in the country. This circumstance inspired the necessity to conductthe current study aiming to explore the level of knowledge and attitude among HCWs towards the outbreak of COVID-19 in the country. Presently, COVID-19 is an everyday dialogue topic in the social media and among the public, particularly among patients and HCWs. Therefore, to ensure the protection of HCPs in Libya from COVID-19, there is a crucial need to increase the understandingand alertness of COVID-19 among HCPs.) (11).

Aims of the study:

This study aims to evaluate preventive measures in hospitals and the awareness of health workers regarding COVID-19 in Benghazi, Libya. The outcomes of this study can be useful in the preparation of health education programmes about this emerging infectious disease.

II. SUBJECTS AND METHODS

Study design:

A cross-sectional survey conducted from 1st of September to 31 of October 2020. Data was collected through semi-structured questionnaire distributed to all employees of the Children's Hospital and the Benghazi Central Medical Hospital. Participants were one hundred and twenty participants who manually completed the questionnaire.

Questioner development and distribution:

The questionnaire was developed, with some adjustments, using the commonly asked queries from the WHO and the national center for disease control websites [7,8]. The questionnaire was designed in English and was pre-validated on 7 HCWs (2 physicians, 2 pharmacists, 1 nurse, 2 technicians) to determine adequacy and the simplicity of the questions, and it was then revised accordingly.

The questionnaire comprised sections addressing knowledge and attitude of HCWs regarding COVID- 19. The first section enclosed demographic characteristics such as age, gender, occupation, place of resident, and respondents' source and suffciency of knowledge on COVID-19. The second section evaluated the knowledge of HCWs by asking queries on the etiology, symptoms, incubation period, risk. The third section of the questionnaire evaluated the attitude and practices of HCWs regarding COVID-19 infection precautions.

Statistical analysis

Data analysis was performed using SPSS version 25. Frequencies and percentages were used to display the qualitative variables, while the mean ± standard deviation (SD) was used to summarize the quantitative variables. Each participant's score was calculated as the percentage and higher scores reflect better awareness. The respondents' attitude was collected in the five-point Likert scale (from absolutely disagree to agree). The highest and lowest score was 5 and 1, respectively.

Ethical issues: Participation in the study was voluntary and the purpose of the study was

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

explained before the survey began. If a participant agreed to give the feedback answer of the questionnaire, this was their consent to participate in the study. Participants' identities were not recorded, and confidentiality was assured.

III. RESULTS:

A total sample of 85 respondents of health care workers were participate in the study. Their mean age was 34.0 ± 9.9 years and Minimum 21 years and Maximum age 69 years.

The present study reported that 50(58.8%) from Benghazi medical center (BMC) and 35(41.2%) from pediatric hospital. The present study reported that more than half of the participants were holders of the bachelor's degree 48(56.5%). The current study group included 25 (29.4%) doctors, 8(9.4%) specialists, 27 (31.8%) nurses, and 25(29.4%) Laboratory technicians. The present study reported that 73 (85.9%) werefemales and (14.1%) were males (table.1)

The present study reported that virus 74(87.1%) respondents Knowledge about Incubation period 3 to14 days were good ,79 (92.9%) influenza like symptoms, 68(80%) maylead to death from Covid pneumonia, and 61(71.8%) is fatal disease (table 2).

The present study reported 47(55.3%) of respondents source of Knowledge were the social media, 27 (31.8%) government web site,6 (7.1%) ministry of health and WHO , and 5(5.9%) family and friends (Figure 1).

Respondents' knowledge about the precautions to avoid covid-19 infections, the present study reported that majority of them agree to avoid traveling, restaurants and public transport {83 (97.6%), 68 (81.2%), and 70(82.9%) respectively}. The current study reported that 62 (72.9%) disagree to avoid medical herbs and 70 (82.4%) disagree to stop going to work and school, 58(68.2) agree to avoid traveling by airplanes, 67(78.8%) agreed to avoid shake hand. The respondents in the present study agreed that personnel hygiene, healthy diet and adequate sleep should be followed during covid-19 epidemic {84 (98.8%) and 56(65.9%), 49(57%) respectively} (table.3).

IV. DISCUSSION:

The rising incidence of COVID-19 continues to cause distress, worry, and fear amongst the public, mostly for healthcare workers, as they are the most vulnerable individuals at risk of contracting this new SARSCoV-2 outbreak[(11)].

This study measured levels of knowledge and attitude regarding COVID-19 among health care workers in Libya.

The distribution of the sociodemographic characteristics of the showed a high percentage of females nurses and most of them were from of the participants holders of the bachelor's degree, this is an indication that nurses were the majority of health workers in Libya during the Corona pandemic.HCWs were familiar with high- risk groups, too. All of these conclusions are much in line with a similar Vietnamese KAP study (12,13).

The results of this study showed that the majority of health care workers showed high knowledge regarding the main clinical symptoms of COVID-19, while a large proportion of them were sure that its symptoms are flu-like(92%) and fatal (80%). Knowledge scores were significantly associated with age. Older HCWs had much higher knowledge scores in terms of COVID- 19 symptoms, transmission, prevention, and control.This is consistent with a study by Hweissa, et al.of the participants, 79.9% were positive with sufficient information about COVID- 19, and 69.8% were following up for outbreak updates.(12).

Where almost all participants knew about the incubation period (1–14 days) of COVID-19, inline with results from India and Vietnam indicating that a majority were aware of the infectious and asymptomatic periods and knew that symptoms appeared in 2–14 days. (14,15,16)

The current study reported that the majority of the respondents source of knowledge was social media (55.3%) this is consistent with findings in Vietnam, where social media was the main source from which health care workers got their knowledge (12). Confirm getting knowledge about COVID-19 from international health websites (11,17,18).This indicates that educational policies and guidelines published online by some health organizations encouraged health care workers to follow them online .

The present study result does not correspond to another study (Huynh Giao et al.2020)where it was found that the majority of respondents know that COVID-19 is a global issue and collected their information through a variety of media such as social media (91.1%), TV (79.2%), Hospital/Ministry of Health website (82.6% (%)(19).

The present study findings showed that (98.8%)of participating healthcare workers were taking care of themselves through personal hygiene

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

and (97.6%) avoided travel and commuting to avoid contracting COVID- 19 infection. Approximately(65.9%)of respondents were eating healthy food, even while on duty.Many participants also protected themselves by avoiding restaurants or shaking hands. Together, the current findings confirm that most health care workers use several preventive measures,

From a previous similar study, it was clear that 41.5% of health care workers are still engaged in their work. Similar conclusions were reached by Zhong et al. , where they stated that the vast majority of participants did not go to any crowded place. (12,20).

The current study revealed that more than one third of participants had used perceptions of prevention and control measures, which is higher than a study from Uganda, (14). The current study revealed that a majority of the HCPs agreed that maintaining hand hygiene, physical/social distance, staying at home can help prevent COVID-19 transmission, in line with studies from India and globally,24,26 and higher than one from Libya. (14,18).

Higher awareness among doctors has also been established in another research, where physicians seemed to be most aware of the signs and symptoms of COVID- 19, indicating that awareness level is linked to the profession of an individual (14,21). The current study revealed that HCWs strongly agreed to continue to apply preventative measures after the outbreak means that there is still a dire need to inculcate good hygiene habits in HCWs to prevent future outbreaks. (14).

Despite the healthcare situation and civil war in Libya, most participants reported good attitude toward the adequate information aboutCOVID-19 in Libyan HCWS. A similar study conducted on a Chinese population reported an overall knowledge of 90% (11,20)

V. CONCLUSION:

This study emphasizes many procedures to control COVID- 19 infection. In the meantime, the Libyan government should develop both thequantity and quality of health services. In terms of sources information, it is important that the Libyan government consider establishing specific channels or website to provide HCWs with correct and updated information, issues, and modernize materials about this infectious disease.

Acknowledgements: The authors thank all HCWs who participated in the study and to those contributed to data collection and entry.

Table .1: Socio-demographic characteristics of the health care workers

Items		Number	Percentage
1.	Hospital		
a)	BMC	50	58.8
b)	Pediatric	35	41.2
2.	Department		
a)	Medicine	15	17.6
b)	Surgery	8	9.4
c)	Pediatric	62	72.9
3.	Age intervals/ years		
a)	18-25	23	27.1
b)	26-40	43	50.6
c)	41-60	19	22.4
4.	Education		
a)	Preparatory	1	1.2
b)	Secondary	24	28.2
c)	Bachelors	48	56.5
d)	Master	6	7.1
e)	Doctoral	3	3.5
f)	Others	3	3.5

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

5.	**Occupation**		
a)	**Doctor**	**25**	**29.4**
b)	**Specialist**	**8**	**9.4**
c)	**Nurse**	**27**	**31.8**
d)	**Lab technician**	**25**	**29.4**
6.	**Gender**		
1.	**Male**	**12**	**14.1**
2.	**Female**	**73**	**85.9**
Total		**85**	**100.0**

Table 2: Respondents knowledge at Benghazi hospitals about the corona virus infection:

Respondents Knowledge about symptoms of corona virus infection			
1.	**Incubation period 3 to14 days**	Frequency	Percent
a)	**Yes**	74	87.1
b)	**No**	3	3.5
c)	**Idonot know**	8	9.4
2.	**Influenza like symptoms:**		
a)	**Yes**	79	92.9
b)	**No**	2	2.4
c)	**Ido not know**	4	4.7
3.	**Covid pneumonia death:**		
a)	**Yes**	68	80.0
b)	**No**	12	14.1
c)	**I do not know**	5	5.9
4.	**Fatal disease:**		
a)	**Yes**	61	71.8
b)	**No**	13	15.3
c)	**Ido not know**	11	12.9
Total		85	100.0

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

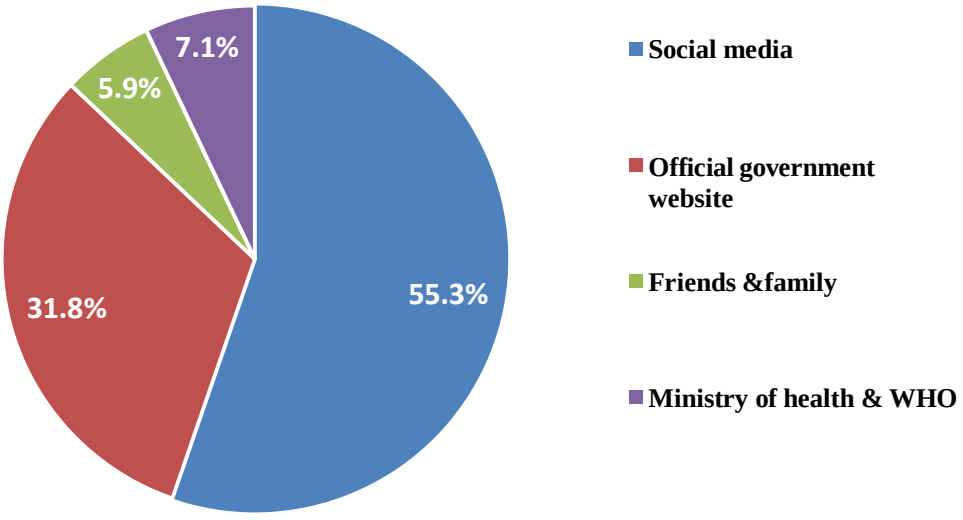

Figure 1: Sources of respondents Knowledge

Table 3: Respondents knowledge about the precautions to avoid covid-19 infections:

Measures HCW take to avoid covid-19 infection		Number	Percent
1.	**Avoid** traveling		
a)	**Yes**	83	97.6
b)	**No**	1	1.2
c)	**No answer**	1	1.2
2.	**Avoid restaurants**		
a)	**Yes**	69	81.2
b)	**No**	14	16.5
c)	**No answer**	2	2.4
3.	**Avoid medical herbs**		
a)	**Yes**	15	17.6
b)	**No**	62	72.9
c)	**No answer**	8	9.4
4.	**Avoid public** transportation		
a)	**Yes**	70	82.4
b)	**No**	13	15.3
c)	**No answer**	2	2.4
5.	**Avoid hand shaking**		
a)	**Yes**	67	78.8
b)	**No**	16	18.8
c)	**No answer**	2	2.4
6.	Healthy Diet		
a)	**Yes**	56	65.9
b)	**No**	24	28.2
c)	**No answer**	5	5.9
7.	**Stopgoingto school&work**		
a)	**Yes**	11	12.9

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

b)	**No**	70	82.4
c)	**No answer**	4	4.7
8.	**Avoid** traveling **of** airplanes		
a)	**Yes**	58	68.2
b)	**No**	20	23.5
c)	**No answer**	7	8.2
9.	**Personal** hygiene		
a)	**Yes**	84	98.8
b)	**No**	1	1.2
10.	Adequate sleep		
c)	**Yes**	49	57.6
d)	**No**	28	32.9
e)	**No answer**	8	9.4
Total		85	100.0

Table 4: Respondents knowledge about methods of prevention and treatment available in the health center:

Preventive measures at hospital		**Number**	**Percent**
1.	**Washing hand with soup**		
a)	**Yes**	77	90.6
b)	**No**	8	9.4
2.	**Sterile work tools**		
a)	**Yes**	58	68.2
b)	**No**	21	24.7
c)	**I do not know**	6	7.1
3.	**Water supply**		
a)	**Yes**	77	90.6
b)	**No**	8	9.4
4.	**Hand wash soup**		
a)	**Yes**	78	91.8
b)	**No**	7	8.2
5.	**Disinfection**		
a)	**Yes**	77	90.6
b)	**No**	8	9.4
6.	**Availability of thermometer**		
a)	**Yes**	38	44.7
b)	**No**	47	55.3
7.	**Protective mask**		
a)	**Yes**	77	90.6
b)	**No**	8	9.4
8.	**Availability cortisone**		
a)	**Yes**	62	72.9
b)	**No**	23	27.1
9.	**Availability of antibiotics**		
a)	**Yes**	62	72.9
b)	**No**	23	27.1
10.	**Oxygen Device**		
a)	**Yes**	59	69.4
b)	**No**	26	30.6

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 587-596 www.ijdmsrjournal.com ISSN: 2582-6018

11.	**Surgical mask**		
a)	**Yes**	68	80.0
b)	**No**	17	20.0
12.	**Disposable clothes**		
a)	**Yes**	57	67.1
b)	**No**	28	32.9
13.	**Clean hand sterilizer**		
a)	**Yes**	84	98.8
b)	**No**	1	1.2
14.	**Gloves**		
a)	**Yes**	77	90.6
b)	**No**	6	7.1
	Missing	2	2.4
15.	**Eye protective shield**		
1.	**Yes**	63	74.1
2.	**No**	22	25.9
Total		85	100.0

Table5: Respondents opinion about methods of spread of covid 19

Items		Number	Percent
1.	**Secretions from sneezing or coughing**		
a)	**Strongly disagree**	5	5.9
b)	**Disagree**	2	2.4
c)	**Neutral**	2	2.4
d)	**Agree**	41	48.2
e)	**Strongly agree**	35	41.2
2.	**Contact contaminated surface**		
a)	**Strongly disagree**	6	7.1
b)	**Disagree**	3	3.5
c)	**Neutral**	10	11.8
d)	**Agree**	28	32.9
e)	**Strongly agree**	37	43.5
missing		1	1.2
3.	**Infected Bite**		
a)	**Strongly disagree**	10	11.8
b)	**Disagree**	6	7.1
c)	**Neutral**	28	32.9
d)	**Agree**	24	28.2
e)	**Strongly agree**	17	20.0
4.	**Spread through air and faces**		
a)	**Strongly disagree**	5	5.9
b)	**Disagree**	15	17.6
c)	**Neutral**	19	22.4
d)	**Agree**	34	40.0
e)	**Strongly agree**	12	14.1
5.	**Toxic sterilization on human health**		
a)	**Strongly disagree**	36	42.4
b)	**disagree**	22	25.9
c)	**Neutral**	11	12.9
d)	**Agree**	9	10.6
e)	**Strongly agree**	7	8.2
Total		85	100.0

REFERENCES:

[1]. Qasim Bukhari, Joseph M. Massaro,2 Ralph B. D"Agostino, and Sheraz Khan,2020 Effects of Weather on Coronavirus Int J Environ Res Public Health. 2020 Aug; 17(15): 5399. Published online 2020 Jul. DOI: 10.3390/ijerph17155399.

[2]. Chan K.H., Peiris J.S.M., Lam S.Y., Poon L.L., Yuen K.-Y., Seto W.H.2011. The Effects of Temperature and Relative Humidity on the Viability of the SARS Coronavirus. Adv. Virol. 2011;2011:1–7. doi: 10.1155/2011/734690. [PMC free article] [PubMed] [CrossRef] [Google Scholar].

[3]. Schoeman D., Fielding B.C, 2019. Coronavirus envelope protein: Current knowledge. Virol. J. 16:69. DOI: 10.1186/s12985-019-1182-0. [PMC free article] [PubMed] [CrossRef] [Google Scholar].

[4]. World Health Organization, 2020. Disease outbreaks by year. Available at: https://www.who.int/csr/don/archive/year/en/. Accessed 18 Mar 2020.

[5]. Cascella, M., Rajnik, M., Cuomo, A., Dulebohn, S.C., Napoli, R.D., 2020. Features, Evaluation, and Treatment Corona Virus (COVID-19), NCBI Bookshelf. StatPearls Publishing.

[6]. N S Zhong, B J Zheng, Y M Li, L L M Poon, Z H Xie, K H Chan, P H Li, S Y Tan, Q Chang, J P Xie, X Q Liu, J Xu, D X Li, K Y Yuen 2003. Epidemiology and cause of severe acute respiratory syndrome (SARS)in Guangdong, People"s Republic of China.Lancet. 2003 Oct 25;362(9393):1353-8. doi: 10.1016/s0140-6736(03)14630-2

[7]. N. Ramadan, H. Shaib,.2019. Middle East respiratory syndrome coronavirus (MERS-CoV): a review Germs., 9 (2019), pp. 35-42, 10.18683/germs.2019.1155 CrossRefView Record in Scopus Google Scholar.

[8]. WHO: Coronavirus disease 2019 (COVID-19) Situation Report - 90. Geneva: WHO. (2020). Available online at: www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports (accessed November 18, 2020).

[9]. Milsten A: Hospital Response to Disasters:A Review. Prehosp Disast Med 2000;15(1):ccc–ddd.

[10]. Alrubaiee, G.G., Al-Qalah, T.A.H. & Al-Aawar, M.S.A. .2020. Knowledge, attitudes, anxiety, and preventivebehaviours towards COVID-19 among health care providers in Yemen: an online cross-sectionalsurvey. BMC Public Health 20, 1541 https://doi.org/10.1186/s12889-020-09644-y.

[11]. Atia,A; and Abdo,M. 2020 .Knowledge and Attitude towards 2019 Novel Coronavirus (COVID-19) Among Health Care Workers in Tripoli, Libya

[12]. Hweissa,N. Shawesh, F.A.. Krema,S.O,and Mansour.A.A .2020. Knowledge, Attitude and Practice (KAP) for Preventing the Coronavirus (COVID19) Pandemic Among Libyan Health Care Workers ., Libyan J Med Sci;4:109-14.

[13]. Huynh G, Nguyen T.N.H, Vo KN, Pham LA. 2020. Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. Asian Pacific Journal of Tropical Medicine,;13:260.

[14]. -Wuneh,A. Kahsay,A. Tinsae,F. Ashebir,F. Giday ,G. Mirutse,G.Gebretsadik,G. Gebremedhin,G. Weldearegay ,H. Berhe ,K. Woldegebriel,M. Weldeselassie,T.2021.Knowledge, Perceptions, Satisfaction, and Readiness of Health-Care Providers Regarding COVID-19 in Northern Ethiopia. Journal of Multidisciplinary Healthcare:14 1349–1359.

[15]. Parikh PASB, Phatak AG, Vadnerkar AC, Uttekar S, Thacker N,Nimbalkar SM. .2020. COVID-19 pandemic: knowledge and perceptionsof the public and healthcare professionals. Cureus. 12(5).

[16]. Huynh G, Nguyen TH, Tran V, Vo K, Vo V, Pham,L. Knowledge and attitude toward .2020.COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. Asian Pac J Trop Med.;13(6):260.doi:10.4103/1995-7645.280396.

[17]. Hweissa NA, Shawesh FA, Krema SO, Mansour AA. Knowledge, attitude and practice (KAP) for preventing the coronavirus (COVID19) pandemic among libyan health care workers. Libyan J Med Sci 2020;4:109-14

[18]. Elhadi M, Msherghi A, Alkeelani M, Zorgani A, Zaid A, Alsuyihili A, et al. Assessment of Healthcare Workers' Levels of Preparedness and Awareness Regarding COVID-19 Infection in Low-Resource Settings. Am J Trop Med Hyg. 2020

Aug;103(2):828-833. doi: 10.4269/ajtmh.20-0330.

[19]. Giao1,H, Han,N., Van Khanh,T,.KimNgan,V,. Van Tam1,V.And Le An,P. 2020.Knowledge and attitude toward COVID-19 among healthcare workers at District 2Hospital, Ho Chi Minh City. Asian Pacific Journal of Tropical Medicine; 13(6): 260-265

[20]. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, et al.2020. Knowledge, attitudes, and practices towards COVID‐19 among Chinese residents during the rapidrise period of the COVID‐19 outbreak: A quick online cross‐sectional survey. Int J Biol Sci;16:1745‐52.

[21]. Maleki SNF, Farhadi K, Fakhri M, Hosseini F, Naderi M. Knowledge, attitude, and behavior of health care workers in the prevention of COVID-19. Res Square.