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Knowledge, Attitude, Perception and Psychological Status of Healthcare Workers During COVID-19 Outbreak in Libya: A Cross Sectional Study

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Abstract

Healthcare professionals, especially those who work in hospitals that treat patients with Coronavirus Infection (COVID-19), are at a higher risk of contracting this disease than workers in other departments. Healthcare workers are under a lot of stress as they fight the COVID-19 outbreak, which increases their risk of developing psychological difficulties. As a result, ill-prepared healthcare workers can lead to delayed diagnosis, disease spread, and poor infection control. An evaluation of Knowledge, Attitudes, Perceptions, and Psychological Effects in light of the COVID-19 pandemic in Libya may indicate effective strategies for behavioral change in a given society and may assess the psychological state of healthcare workers during that crisis. At present, Libyan healthcare workers are not well aware of the risks. Healthcare workers participated in a web-based cross-sectional survey during the COVID-19 pandemic in 2020. The KAP questions are imported from Egyptian study and the psychological impact questions are imported from Chinese study that used the Generalized Anxiety Disorder Scale, Patient Health Questionnaire and Insomnia Severity Index. Questions are adapted to be suitable for the Libyan context. The Knowledge, attitude and perception were analyzed using a total score based on Bloom's 80% cut-off. According to our results, in total, we received 85.4% high knowledge score of Libyan HCWs in regards to COVID-19. About 54.6% participants showed negative attitude towards COVID-19 infection and the precautionary measures taken to prevent its spread. The majority of respondents, 89.1%, felt that they were vulnerable to COVID-19 infection. 85.4% believed they were more likely than others to become infected. Fear of transmission to family members, having chronic illnesses, and community stigma are the most frequently reported reasons for higher risk perceptions. In general, HCWs had a good understanding of COVID-19. Negative attitudes are evident in the observations a high level of risk perception was evident. It is vital that the Libyan Ministry of Health and government consider the reasons for increased risk perception. Healthcare workers, specifically those who are responding to COVID-19 in Libya, experienced an increase in anxiety, depression and insomnia, which were respectively 30.1%, 31.9% and 18.9%. In this study, many Healthcare workers reported adequate overall knowledge with a negative attitude toward government and adopted appropriate practices. Psychological problems are directly related to inadequate knowledge, incorrect attitudes, and inadequate perception. However, with timely interventions and correct information, it will be possible to protect the mental wellbeing of healthcare professionals during the novel coronavirus epidemic.

Keywords: Knowledge, attitude, perception, psychological impact, healthcare, Libya, COVID-19, Coronavirus, SARS-CoV-2

INTRODUCTION

Novel coronavirus disease (COVID-19) is an extremely expanding pandemic affecting the entire world. It was predicted to become the global health issue of 2020 (WHO). Several non-aquatic animals, as well as fish, were also being sold at the same market before the outbreak was found to be connected.[1] A case of COVID-19 was confirmed in Tripoli on 24 March 2020, marking the beginning of this outbreak in Libya.[2]

Healthcare providers are in the front line of the COVID-19 pandemic, but they are also forced to cope with psychological stress, long hours, fatigue, occupational stigma, and physical violence due to global closures.[3] Healthcare workers' transmission can be facilitated by overcrowding, a lack of isolation rooms, and contaminated environments. Nevertheless, some HCWs are likely unaware of infection prevention practices, which further compounds the problem.

When working with infected patients, healthcare staff must have a strong understanding of the disease, a positive attitude, and the ability to recognize preventative measures such as wearing gloves, protective clothing, goggles, and a mask. It is apparent that due to the ongoing pandemic nature of this disease, healthcare workers must take more precautions and adhere to hygienic regulation.[4]

Healthcare workers' attitudes and practices may be affected by knowledge of a disease, and incorrect attitudes and practices direct increase the risk of infection.[5] Predicting the outcomes of COVID-19 in Libya is possible when we understand Healthcare workers' knowledge, attitudes, and perceptions of risk. This study

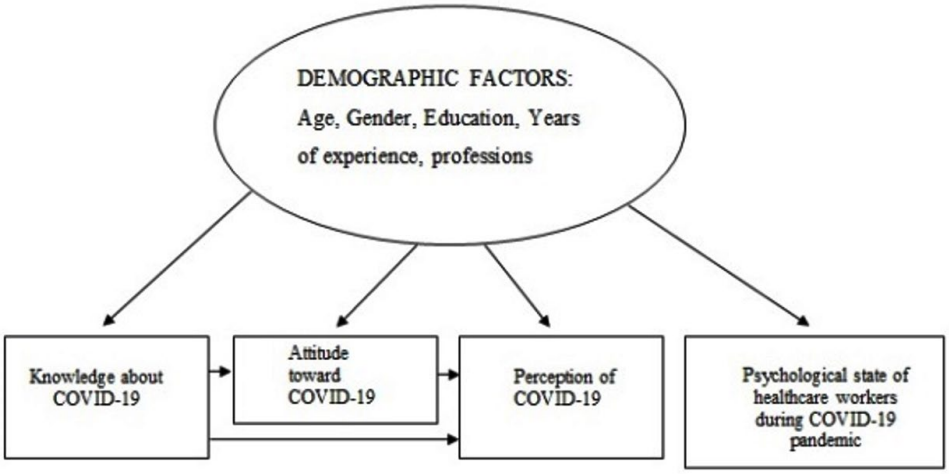

Fig. 1. Conceptual Framework.

was aimed to measure the level of knowledge, attitude, perception and psychological state of Libyan Healthcare workers regarding the risks of infection with COVID-19.

Literature reviews

Research follows the KAP theory and Health belief model that explain how Conceptual frameworks are developed. The "KAP hypothesis," proposed by western scientists in the 1960s, defines three sequential processes in the creation of behavior in health behavior modification. Human behavioral changes are classified as follows: knowledge acquisition, attitude formation, behavior formation, and social behavior. This theory outlines how knowledge, attitudes, and behavior may be changed in progressive ways: knowledge underpins behavior change and beliefs and attitudes drive it. According to Fan et al.,[6] the "Health Belief Model" was introduced in the 1950s. The model suggests that people's health belief determines their ability to adapt to persuasion, change bad habits, and adapt healthy behaviors. As a result, we used the KAP theory and the health belief model as a framework for conducting our research. Thus, this study aimed to evaluate the knowledge, attitudes, perception, and psychological impact of COVID-19 among healthcare workers. It is also studying the associations between demographic profile (age, gender, education, years of experience and professions) and knowledge, perception, and attitude among workers of healthcare sector in Libya as shown in Fig. 1.

MATERIALS AND METHODS

Study design

As a result of the lockdown in Libya to prevent the spread of the pandemic, the study used the self-administered online survey as a cross-sectional study. Participants in the online survey included doctors, residents, nurses, technicians, and public health workers. The survey link has been shared with the healthcare worker groups on Facebook, Viber and WhatsApp. In addition, the author has personally shared the link with healthcare workers that known.

Study sample

Research conducted in Libya, an African country within the Maghreb region. The sample of the study is any employee who is working in healthcare sector in Libya for year 2020-2021. Convenience sampling was used to select participants. The sample size was calculated using Kerjici and Morgan's (1970) formula: n = [z2 * p * (1 - p) / e2] / [1 + (z2 * p * (1 - p) / e2 * N)]. Where z = 1.96 indicates a 95% confidence level, p = proportion 50% (represented as a decimal), N = population size, and e = margin of error 5%.

Study Tools

The author of this study used a self-administered questionnaire, which was imported from previous studies, the KAP questions

are imported from Egyptian study[7] and the psychological state questions imported from Chinese study[8] which study questionnaires used the Generalized Anxiety Disorder Scale (GAD-7), Patient Health Questionnaire (PHQ-9) and Insomnia Severity Index (ISI) in study questionnaire. Written in English and adapted to suit the Libyan context, the questions are formulated in English.

We asked questions from various categories; (I) The demographic information included were about age, gender, hospital, department, educational level, and source. (II) Information about COVID-19 sources which contains seven questions. Answers were listed by most frequently used, sometimes used, and least used on each question (III) knowledge section which included a total of twenty-four multiple choice questions addressing the most important information, virus transmission methods, and the prevention of diseases. The respondents answered all questions either yes, no, or did not know. There were some questions that needed a yes response, while other others demanded a no response. Regarding the twenty-four questions about knowledge, one point was given for each correct answer and a score of zero for the incorrect answer or answer that you did not know. According to Kaliyaperumal[9] the total scores for knowledge, attitude, and practice were categorized into good/positive or poor/negative based on Bloom's cut-off 80% point out of the total expected score for each part.[10] The total knowledge score ranges from 0-24 and a score of ≤19 indicates poor knowledge while a score of ≥20 (more than 80% of total score) was defined as having a good knowledge. (IV) The attitude section: In this study the attitude survey is a survey of the opinions held by healthcare workers toward COVID-19. The survey included ten questions about healthcare workers' perspectives toward COVID-19 as a preventable and manageable illness (four points) and their attitudes on Libyan government policy on COVID-19 (six items). Two different attitude scores were computed: the first score relates to the attitude of healthcare workers towards COVID-19 as a disease that may be prevented (four items, ranging from 4 to 20 scores), another attitude score relates to their attitude towards government measures for the COVID-19 conflict (6 items, with score 6-30). The total attitude score (ten items, up to a maximum of 50 scores), For each issue, there were five different kinds of responses: 5 points for strongly agreeing, 4 points for agreeing, 3 points for uncertain, 2 points for disagreeing, and 1 point for strongly disagreeing. A respondent who scored ≥40 of total attitude score (almost 80% of total score) defined as having a positive attitude. (V) The perception section outlined how health care workers felt about the COVID-19 infection. Two statements were included: (1) COVID-19 infection is more likely to affect me than others, or (2) I'm afraid to become infected with COVID-19. There are three possible responses: yes, no, or undecided. According to researchers, there are some explanations for why some people believe they are more vulnerable to COVID-19 infection or perceive themselves to be fearful of becoming infected. Questions were included in each statement, and responses were recorded according to 5-point Likert scale: Strongly agreeing gets 5 points, agreeing gets 4 points, unsure gets 3 points, disagreeing gets 2 points, and strongly disagreeing gets 1 point. Total perception score (17 items, with maximum score 85). A respondent who scored ≥68 of total perception score (more than 80% of total score) was defined as having an acceptable perception. (VI) Mental and emotional state of healthcare workers: it consists of Generalized Anxiety Disorder Scale (GAD-7) to assess anxiety, Patient Health Questionnaire (PHQ-9) to assess depression, and Insomnia Severity Index (ISI) to assess insomnia. A GAD-7 score of ≥10 reveals moderate to severe anxiety, a PHQ-9 score of ≥10 indicates moderate to severe depression, and an ISI score of ≥15 suggests moderate to severe insomnia, according to Que et al.,[8] Any sign of mild anxiety, depression, or insomnia was classified as minor psychological disorders, whereas any indication of moderate/severe anxiety, depression, or insomnia was classified as moderate/severe psychological disorders.[8]

Statistical analysis

Statistical Package for Social Sciences software version (SPSS 23) was used to code and analyze the survey, which was collected to obtain and check for completeness. Descriptive analysis focused on frequencies, and percentages. Hypotheses testing using non-parametric test. Mann-Whitney U and Kruskal Wallis H tests were

applied to compare scores of each variable with various demographic factors. Mann-Whitney Test was done to compare whether there is a difference in the dependent variable for two independent groups, while Kruskal Wallis was done to identify the statistical differences in the dependent variable between more than two independent ordinal variables that are not normally distributed. The phi correlation coefficient (phi) is a statistic that shows how knowledge, attitude, and perception scores are related. Statistical significance was defined as a P value of less than 0.05.

RESULTS

Demographic characteristics

Three hundred and ninety-two healthcare workers from different cities in Libya have completed the survey. Almost half of the participants (50.3%) were females and 49.7% were males. They ranged in age from 25 to 67 years old. More than half (64.5%) had a university degree, 21.4% had higher education and only 2.3% had completed high school. A majority of the study participants (53.1%) were physician while pharmacist (19.9%), were followed by technicians (11.2%), nurses (11.2%) and employee (4.6%). Study participants primarily worked in university hospitals and general hospitals (68.1%) and 31.9% in pharmacies, private clinics, and other clinics. The majority of participants were working in Tripoli (46.2%), which is the capital of Libya. then Benghazi (23%), which are a major seaport and the second-most populous city in the country, comparing with other cities. The study group represented 61.7% of those who worked directly with patients. Participant responses indicate social media (58.9%), government websites (45.2%), and mass media (44.4%) were the most prevalent sources of COVID-19 information while seminar and workshops (17.1%) and family member, colleague or friend (11 %) were the least used. Tables 1 and 2 provide more information.

KAP situation of healthcare professionals regarding COVID-19

The KAP scores of the healthcare workers regarding COVID-19 were (85.4% good, 14.8 poor), (54.6% negative, 45.4% positive) and (73.5% high, 26.5% low), respectively. In Table 3, we summarize participants' knowledge of COVID-19, including information on general characteristics,

Table 1. Demographic characteristics of the study group (n= 392)

		N	%
Gender	Male	195	(49.7)
	Female	197	(50.3)
Age (years)	25-34 years	130	(33.2)
	35-44years	105	(26.8)
	45-54 years	56	(14.3)
	55 years and above	101	(25.8)
Education	PhD	35	(8.9)
	Master	49	12.5
	Bachelor	253	64.5
	Diploma	46	11.7
	High school education	9	2.3
Work experience	Less than 5 years	113	28.8
	5-10 years	104	26.5
	More than 10 years	175	44.6
professions	Physician	208	53.1
	Nurse	44	11.2
	Pharmacist	78	19.9
	Technician	44	11.2
	Employee	18	4.6
Work place	Public Clinic/ Hospital	267	68.1
	Private Clinic/ Hospital	51	13.0
	Pharmacy	39	9.9
	Medical analysis lab	35	8.9
Work location	Tripoli	181	46.2
	Benghazi	90	23.0
	Misrata	20	5.1
	Alzawia	18	4.6
	Al bayda	12	3.1
	Ben walid	10	2.6
	Khoms	9	2.3
	Zuwara	9	2.3
	Sirte	13	3.3
	Sabha	9	2.3
	Sebratha	11	2.8
	Garyan	10	2.6
Direct contact with patient	Yes	242	61.7
	No	81	20.7
	Maybe	69	17.6

methods of transmission, and possible prevention measures. Among the participants, more than half identified the right answers to all questions. The following questions are the least correct responses: COVID-19 is always fatal where only 47.7% correctly identified that COVID-19 is not always fatal. About 54.8% participants thought that the Antibiotics are the treatment of choice for COVID-19. Furthermore, most COVID-19 preventive measures were correctly reported by participants.

Despite the fact that the vast majority of our participants agreed that COVID-19 could be prevented (91.6%), they concurred that infection control standard precaution might provide protection in the case of COVID-19 (90.8%). The vast majority of HCWs considered this disease is a sever disease (87.8%). While the majority of our respondents commented on the role of the government in diagnosing, treating and dealing with COVID-19 infection, 96.2 % of HCWs agreed that illness cases had been recovered. 57.2 % believed that the authorities can manage the COVID-19 issue, and 55.4% trusted the information released by the Libyan Ministry of Health and Population. Additionally, (55.1%) are more confident in the accurate diagnosis of COVID-19 disease in Libya as shown in table 4.

Concerning respondent's perception, in comparison to others, 84.7 % of our respondents reported that they were more prone to COVID-19 disease. Fig. 2 shows that 89% of them were afraid of contracting COVID-19 disease. The most frequently cited reasons by Libyan healthcare workers regarding their greater sensitivity to COVID-19 infection than others were as follows; Poor ventilation in the workplace is ideal for spreading COVID-19 infection (94.9%), the community is not dedicated to preventative measures (92.6%), and the conditions (crowding) in the workplace are conducive to infection transmission. (91.1%). The following were the most mentioned sources of participants' worry of COVID-19 infection: Fear of infecting their relatives (95.9%); the disease is very contagious and potentially fatal (95.2%); it is a new disease with unknown therapy (92.8%) and vaccination (95.2%); and it is a new disease with unknown treatment (92.8%) and vaccine (95.2%) (Table 5).

Prevalence of psychological disorders among healthcare personnel

Anxiety, depression, and insomnia were uncommon in Libya's healthcare sectors. In terms of anxiety, 30.1 % of the professionals had GAD-7 scores of ≥5, with 19.4 % having mild anxiety and 10.7 % having moderate/severe anxiety. The highest rate of anxiety symptoms was discovered in nurses (38.6 %). Physicians were found to have the lowest rate of anxiety symptoms (26%). When it came to depression, 31.9% of the professionals had PHQ-9 scores of ≥5, with 21.4% having mild depression and 10.5% having moderate/severe depression. Nurses were found to have the highest incidence of depressed symptoms (38.6%). Pharmacists were found to have the lowest incidence of depressed symptoms (25.6%). In terms of insomnia, 18.9% of healthcare professionals had ISI ratings of 8 or above, with 17.6% having subthreshold insomnia and 1.3% having moderate/severe insomnia. Nurses were found to have the highest prevalence of insomnia symptoms (36.4%). Physicians had the lowest prevalence of sleeplessness complaints (12.5%) (Table 6).

Table 2. Information Sources for participants regarding COVID-19 (n=392)

	Least used N (%)	Sometimes N (%)	More often N (%)	Most Used N (%)
Mass Media such as TV, radio and newspapers	67 (17.1%)	151 (38.5%)	156 (39.8%)	18 (4.6%)
Social media such as Facebook , WhatsApp.	35 (8.9%)	126 (32.1%)	158 (40.3%)	73 (18.6%)
Official government websites	49 (12.5%)	166 (42.3%)	127 (32.4%)	50 (12.8%)
Physician	154 (39.3%)	159 (40.6%)	58 (14.8%)	21 (5.4%)
Family member, colleague or friend	211 (53.8%)	138 (35.2%)	36 (9.2%)	7 (1.8%)
Free online courses or training	184 (46.9%)	122 (31.1%)	60 (15.3%)	26 (6.6%)
Seminars and workshops	181 (46.2%)	144 (36.7%)	47 (12.0%)	20 (5.1%)

Association between knowledge, attitude, and perception/practices score

Each of the characteristics were expected to be related according to KAP model. The phi correlation coefficient (phi) is a statistic that shows how knowledge, attitude, and perception scores are related. The following criteria were used to interpret the correlations: 0–0.25 = weak correlation, 0.25–0.5 = reasonable correlation, 0.5–0.75 = strong correlation, and greater than 0.75 = excellent correlation (Table 7).

The association between sociodemographic characteristics of Libyan healthcare workers and their knowledge, attitude, and perception of COVID-19

Regarding to COVID-19 knowledge, the knowledge score was significantly greater in physician (mean rank=211.37) than pharmacist, technician, employee and nurse (mean rank=197.86, 176.50, 160.17, 158.68) respectively (p-value=0.000). Also in Education, PhD holder has better knowledge compared to master, bachelor, high school education and diploma respectively. With a p-value less than 0.05, there is a statistically significant difference in attitude score between participants based on age, gender, and work experience. HCWs over 45 years old (mean rank= 218.61) exhibited a more positive attitude than HCWs under 45 years old (mean rank= 181.73). The older the healthcare personnel are, the better their attitude score tends to be. With a p-value of 0.020, gender differences in attitude score were found. Males had a higher attitude score (mean rank=208.01) than females (mean rank=185.10).

Table 3. COVID-19 knowledge of Libyan healthcare workers (n= 392)

	Total corrected answers N (%)	None corrected answers N (%)
COVID-19 is caused by virus	389 (99.2%)	3 (0.8 %)
COVID-19 is spread by direct contact with infected individuals.	370 (94.4%)	22 (5.6%)
COVID-19 is spread through contact with domestic animals	272 (69.4 %)	120 (30.6%)
The incubation period is 2-14 days	369 (94.1%)	23 (5.9%)
Antibiotics are the medicine of choice for COVID-19 treatment	215 (54.8%)	177 (45.2%)
COVID-19 vaccination is available	355 (90.6%)	37 (9.4%)
patients with comorbidities like diabetes are more susceptible to COVID-19 infection and its complication	369 (94.1%)	23 (5.9%)
elderly are more susceptible to COVID-19 infection and its complication	380 (96.9%)	12 (3.1%)
Healthcare workers are more vulnerable to infection	362 (92.3%)	30 (7.7%)
COVID-19 is always fatal.	187 (47.7%)	205 (52.3%)
COVID-19 is transmitted through mosquito bites	318 (81.1%)	74 (18.9%)
COVID-19 is transmitted via air droplet	357 (91.1%)	35 (8.9%)
The COVID-19 virus can be transmitted through contaminated food and drink	272 (69.4%)	120 (30.6%)
Fever, cough, tiredness and shortness of breath are symptoms of COVID-19	387 (98.7%)	5 (1.3%)
COVID-19 can lead to pneumonia and acute respiratory failure.	367 (93.6%)	25 (6.4%)
COVID-19 prevention measures		
Hands should be washed with soap, water, or alcohol.	392 (100%)	-
Do not touch eyes, nose and mouth	382 (97.4%)	10 (2.6%)
Coughing while covering the nose and mouth	388 (99%)	4 (1%)
Wear a mask when physical distancing is not possible	384 (98%)	8 (2%)
Maintain a one-meter separation between people.	384 (98%)	8 (2%)
Avoid close contact with colleagues	384 (98%)	8 (2%)
Stay home if you feel unwell	386 (98.5%)	6 (1.5%)
Avoid crowded places, close-contact settings, confined, and enclosed spaces with poor ventilation.	384 (98%)	8 (2%)
health workers should use medical masks continuously during all routine activities in clinical areas in healthcare facilities.	385 (98.2%)	7 (1.8%)

Table 4. Attitude of Libyan healthcare workers regarding COVID-19 (n= 392)

	Strongly Agree answers N (%)	Agree answers N (%)	Undecided answers N (%)	Disagree answers N (%)	Strongly disagree answers N (%)
COVID-19 is a sever disease	219 (55.9%)	125 (31.9%)	20 (5.1%)	27 (6.9%)	1 (0.3%)
It is possible to avoid COVID-19	108 (27.6 %)	251 (64%)	25 (6.4%)	8 (2 %)	-
COVID-19 is preventable with standard precautions.	114 (29.1%)	242 (61.7%)	30 (7.7%)	6 (1.5%)	-
COVID-19 cases will increase	133 (33.9%)	195 (49.7%)	61 (15.6%)	3 (0.8%)	-
I am certain that Libya will be able to defeat COVID-19.	56 (14.3%)	168 (42.9%)	122 (31.1%)	37 (9.4%)	9 (2.3%)
I am trusting the material circulated by the Libyan MPH about COVID-19	52 (13.3%)	165 (42.1%)	129 (32.9%)	35 (8.9%)	11 (2.8%)
There are patients recovered from the disease	138 (35.2%)	239 (61%)	11 (2.8%)	1(0.3%)	3 (0.8%)
The Libyan government's regulations are sufficient to control the disease	32 (8.2%)	141 (36%)	118 (30.1%)	69 (17.6%)	32 (8.2%)
COVID-19 is accurately diagnosed in Libya	40 (10.2%)	176 (44.9%)	112 (28.6%)	49 (12.5%)	15 (3.8%)
I am confident in the Libyan facilities that deal with and treat COVID-19 patients	41 (10.5%)	169 (43.1%)	122 (31.1%)	39 (9.9%)	21 (5.4%)

Table 5. Respondents Perception of COVID-19 among HCWs (n= 392)

I am more vulnerable to COVID-19 infection than anybody else because		I am afraid of contracting the COVID-19 virus because	
	Total Agree answers N (%)		Total Agree answers N (%)
It's a new disease with few information	353 (90%)	It is a new infection with no known cure	364 (92.8%)
PPE is not readily available	326 (83.2%)	It is a new disease with unknown vaccine	360 (91.8%)
I am not comfortable to use the PPE	247 (63%)	The disease is very contagious	373 (95.2%)
I am not well qualified to use the PPE	246 (62.7%)	The infection may be lethal	373 (95.2%)
PPE is not adequate to protect from infection	247 (63%)	I could spread the disease to my family	376 (95.9%)
The condition (crowding) in the workplace is appropriate for spreading the disease	357 (91.1%)	I have comorbidities	278 (71%)
Poor ventilation in the workplace is appropriate for spreading COVID-19 infection	372 (94.9%)	The society stigmatizes those who get infection	329 (83.9%)
The community is not dedicated to the protective measures	363 (92.6%)	The response of the health authorities is insufficient	320 (81.7%)
		Fear of being isolated in the hospital	322 (82.1%)

In comparison to the other group, the long experience group (mean rank=213.90) had a better attitude. The perception of healthcare workers is considerably higher in the older age and long work experience groups, with p-values of 0.000 and 0.030, respectively (Table 8).

The association between sociodemographic characteristics of Libyan healthcare workers and Psychological state scores of COVID-19

Overall, there is a significant difference between Libyan healthcare workers (p-value < 0.05) when it comes to the relationship between demographic variables and COVID-19 depressed condition. The depression score was greater in the elderly, male, PhD holder, HCWs more than 10 years' experience. The anxiety score regarding COVID-19 was higher significant in older age (mean rank=228.18) than younger age (mean rank=175.33). The anxiety score was significant higher in master holder than PhD, bachelor, diploma and high education school respectively. Additionally, significantly increased anxiety score was detected in healthcare workers which had more than 10 years' experience. No significant difference anxiety according to gender and Professions were noted. The mean insomnia score was higher in the PhD holder (mean rank=253.49) and nurses (mean rank=142.30). Refer to table 9 for more details.

DISCUSSION

The research was carried out during the first week of September 2020, and few days after peak increase of COVID-19 in Libya, in August, there have been 10,035 additional cases, making the total number of identified cases to 13,656 from arrival date of COVID-19 in Libya on 24 March 2020. During the study, healthcare workers in Libya were asked to measure their knowledge and attitudes about infection risk, as well as their perception of infection risk. Also, COVID-19 will be measured for it's the mental and emotional state on health care professionals in Libya. By the end of November during the time when this manuscript was being written, there were officially confirmed cases of 82,809 and deaths of 1,183.[11]

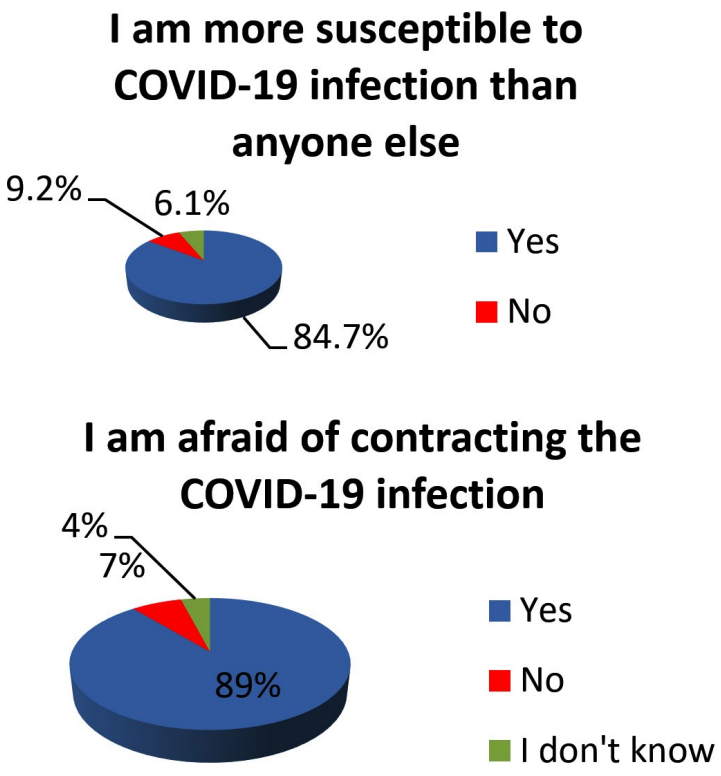

Fig. 2. COVID-19 Risk perceptions of study participants.

Table 6. Results of mental and emotional state in libyan healthcare professionals

	Anixety			Depression			Insomnia	
	No n(%)	Mild n(%)	Moderate/ sever n(%)	No n(%)	Mild n(%)	Moderate/ sever n(%)	No n(%)	Subthreshold n(%)	Moderate/ sever n(%)
HCWs (n=392)	274 (69.9%)	76 (19.4%)	42 (10.7%)	267 (68.1%)	84 (21.4%)	41 (10.5%)	318 (81.1%)	69 (17.6%)	5 (1.3%)
Physcian (n=208)	154 (74%)	31 (14.9%)	23 (11.1%)	139 (66.8%)	42 (20.2%)	27 (13%)	182 (87.5%)	23 (11.1%)	3 (1.4%)
Pharmacist (n=78)	51 (65.4%)	23 (29.5%)	4 (5.1%)	58 (74.4%)	14 (17.9%)	6 (7.7%)	62 (79.5%)	15 (19.2%)	1 (2.3%)
Technician (n=44)	29 (65.9%)	13 (29.5%)	2 (4.5%)	30 (68.2%)	14 (31.8%)	-	33 (75%)	11 (25%)	-
Nurse (n=44)	27 (61.4%)	7 (15.9%)	10 (22.7%)	27 (61.4%)	9 (20.5%)	8 (18.2%)	28 (63.6%)	15 (34.1%)	1 (2.3%)
Employee (n=18)	13 (72.2%)	2 (11.1%)	3 (16.7%)	13 (72.2%)	5 (27.8%)	-	13 (72.2%)	5 (27.8%)	-

Table 7. Association of Knowledge-, Attitude-, and Perception score

	Phi value	p-value
Knowledge - Attitude	-.096	.057
Knowledge - Perception	-.071	.000
Attitude - Perception	.142	.005

A high level of knowledge was present among HCWs about COVID-19 in the current study. The majority of participants' knowledge response was 85.4%. Study results from China, Vietnam, Pakistan, and Egypt indicate similar findings (89%, 88.4%, 93.2%, and 80.4%, respectively). In addition, Ugandan research have posted almost 70% of their participants have adequate level of knowledge,[12] but it has a lower level of knowledge, compared to this study, which used the same cut-off point to determine adequate knowledge (80%). On the contrary, the Bhagavathula et al[13] study discovered that a large number of HCWs had poor knowledge of disease transmission (61.0%) and symptom onset (63.6%).

With regard to the knowledge of the transmission routes, symptoms, and COVID-19 treatment, it was shown that medical doctor had a statistically significant greater level of expertise followed by pharmacists, technicians, staff, and nurses. This was similar to previous findings[14,15], while Olum et al.,[12] reported that healthcare professionals in Uganda regardless of their profession or qualifications, there is no statistically significant differences in their knowledge level towards COVID-19. Additionally, our study found that participants with higher education knowledge about COVID-19 were significantly higher than that of participants with lower education levels. This finding supported by reports from china, which found high knowledge of COVID-19 in Chinese participants because of the characteristics of the sample: 82.4% of the study sample holds a university degree or higher.[14] Based on a study conducted in Northwest Ethiopia, health care workers with master's degrees had better knowledge of COVID-19 than diploma holders.[16] Overall, our results show that health care workers attitude are positive towards COVID-19 as a preventable disease and they are negative towards government administration. The Libyan healthcare workers attitude score did not

Table 8. Statistical analysis of study participants characteristics in relation to their knowledge, Attitude, perception scores in relation to COVID-19 (n=392)

	K score	P-value	A score	P-value	P score	P-value
Age [a]		0.424		0.000*		0.000*
25-44 years	115.90		181.73		183.44	
45-67 years	120.60		218.61		216.04	
Gender [a]		0.371		0.020*		0.077
Male	193.34		208.01		204.27	
Female	199.63		185.10		188.80	
Education [b]		0.000*		0.253		0.910
PhD	214.30		208.30		198.10	
Master	205.50		203.50		204.50	
Bachelor	199.93		197.37		196.59	
Diploma	153.07		188.46		188.85	
High school	203.72		129.28		183.17	
Experience [b]		0.038		0.006*		0.030*
>5 years	187.34		180.35		184.32	
5-10 years	189.69		184.77		188.19	
<10 years	206.46		213.90		209.30	
Professions [b]		0.000*		0.395		0.238
Physician	211.37		203.62		199.50	
Nurse	158.68		187.68		186.14	
Pharmacist	197.86		195.45		193.22	
Technician	176.50		187.68		212.86	
Employee	160.17		161.94		161.39	

* Statistically significant $p \leq 0.05$.

notice any significant difference in the attitude between the physician and professions. This comes in opposite to Zhang et al.,[14] that discovered that HCWs, as doctors who engage with patients on a daily basis, had a more upbeat outlook. On the other side, and in comparison, to Egypt's high level of knowledge, physicians discovered a less favorable attitude on the COVID-19 issue and the government's involvement in preventing and controlling COVID-19[7], which is the opposite of the current situation. This study found physicians have the highest position regarding the COVID-19 situation and government role. Males had a significantly higher Attitude score than females ($p = 0.020$). 55 years old and above had highest Attitude score than others. Additionally, there was significant difference in Attitude according to the work experience, HCWs that have been work experience for more than 10 years more had the highest Attitude score than others. This was consistent with china, who found that healthcare workers with five to nine years of experience had positive attitudes, were less likely to feel fatigued, indicating that this group had particular skill and experience in handling public health emergencies.[14]

Infection is the most common fear of health care workers. They fear spreading the illness to their families. In addition to this fear, many people believe that the disease is highly contagious and it's may be fatal. Approximately 83.9% of respondents indicated stigma associated with infection. This was somewhat high compared to the findings of Wahed et al.,[7] where approximately 66.6% of healthcare workers respondents reported stigma associated with the disease. Stigma has a strong impact on workers' outcomes. Stigma can have effect on worker compliance and can guide management communication strategies regarding pandemic risk for healthcare professionals.[17] Stigma may be combated by effective education, public announcements of clear healthcare policy, and the adoption of stigma-reducing initiatives in Libyan hospitals. Poor ventilation in the workplace,

Table 9. The association between study participants' sociodemographic characteristics and their psychological state dimensions in this study (n=392)

	Anxiety	P-value	Depression	P-value	Insomnia	P-value
Age [a]		0.000*		0.000*		0.440
25-44 years	175.33		174.76		194.05	
45-67 years	228.18		229.04		200.17	
Gender [a]		0.054		0.012*		0.213
Male	205.42		208.34		201.37	
Female	187.67		184.78		191.68	
Education [b]		0.007*		0.005*		0.000*
PhD	211.41		232.24		253.49	
Master	233.15		219.14		215.54	
Bachelor	191.42		193.11		186.85	
Diploma	185.57		176.03		193.15	
High school education	137.50		134.00		159.50	
Work experience [b] >5 years		0.000*		0.000*		0.616
5-10 years	185.49		176.19		194.40	
<10 years	168.70		174.57		191.84	
	220.13		222.65		200.62	
Professions b		0.405		0.409		0.003*
Physician	189.60		200.10		184.22	
Nurse	218.59		214.22		230.70	
Pharmacist	201.06		183.83		199.67	
Technician	199.57		189.84		207.88	
Employee	194.94		182.75		213.25	

* Statistically significant p ≤ 0.05.

which is appropriate for transmitting COVID-19 infection, was the most common cause for feeling more susceptible, followed by dealing with the public who are not aware of precautionary measures and workplace congestion. Likewise, Saqlain et al.,[14] and Maleki et al.,[15] observed that insufficient supply of infection control equipment and congested emergency rooms have been identified as impediments to infection management practices, putting patients at a high risk of getting COVID-19.

The Psychological state towards COVID-19 score of participants was mild among Libyan healthcare workers, which was low than expected due to a stigma associated with mental illness among the Libyan community, which discourages individuals from admitting it. Anxiety, depression, and insomnia were prevalent among Libyan healthcare professionals during the COVID-19 pandemic, at 30.1 %, 31.9 %, and 18.9 %, respectively; This was somehow low than Huang et al.[5] finding out of 230 HCWs of mental problems: overall anxiety (23–44%), depression (50.4%), and insomnia (34.0%). In addition, another study conducted in China found that a high percentage of participants (44.6%, n=560) reported anxiety symptoms, (50.4%, n=634) depression, (34.0%, n=427) insomnia and (71.5%, n=899) distress (Lai, J., et al.2020). The anxiety score regarding COVID-19 was higher significant in older age but no significant difference anxiety according to gender and Professions were noted. This comes in opposite to study that conducted among oncologists in the MENA region, Female and young physicians reported higher levels of anxiety and stress, while oncologists over 55 years of age working in the public sector reported lower levels of stress and anxiety. Even in extremely stressful and anxious situations, the general well-being of the physicians was well maintained.[18]

CONCLUSION

COVID-19 pandemic is a challenge to humanity. The health care workers in this study are well aware of knowledge of Coronavirus disease, mode of transmission and symptoms. It reported a positive attitude and adopted the appropriate practice. The psychological status of healthcare workers during the COVID-19 outbreak is an important theme to study. New Coronavirus strains are continuously emerging and spreading globally, threatening our ability to treat these infectious diseases. A growing list of infections is becoming harder, and sometimes impossible, to treat. The sections and subsections are coherent and well discussed with suitable supporting literature. However, some irregularities remain and must be corrected.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS' CONTRIBUTION

MBAL performed data curation, investigation, validation, formal Analysis and wrote the original draft. MAA supervised, validate, conceptualized the study, wrote, review and edited the manuscript. MFB performed survey, developed survey tools, and analyzed the data sets. All authors read and approved the final manuscript for publication.

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DATA AVAILABILITY

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

ETHICS STATEMENT

This study was approved by the Ethics Committee of Management and Science University (MSU), Shah Alam, Selangor, Malaysia.

INFORMED CONSENT

Written informed consent was obtained from the participants before enrolling in the study.

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