Awareness of Libyan Females in Different Communities about the Environmental Factors and Control Measures related to Covid-19 novel epidemic

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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, 2019 where the first case was reported to the WHO 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). As the outbreak of COVID-19 expanded beyond China, the World Health Organization (WHO) characterized it on 11th March 2020, as a pandemic disease (7).

The etiological agents have been confirmed as a new subset of coronaviruses (13,14). The spread of SARS-CoV-2, like other respiratory viruses, namely its predecessor SARS-CoV, may be due to spread via droplets and contact, exposing the virus to external environmental conditions (13). The main route of transmission of SARS CoV infection is presumed to be respiratory droplets. However, the virus is also detectable in other body fluids and excreta.

The stability of the virus at different temperatures and relative humidity on smooth surfaces were studied (2,8,9,10,11,12,). The dried virus on smooth surfaces retained its viability for over 5 days at temperatures of 22–25∘C and relative humidity of 40–50%, that is, typical air-conditioned environments. However, virus viability was rapidly lost at higher temperatures and higher relative

humidity (e.g., 38∘C, and relative humidity of > 95%). The better stability of SARS coronavirus at low temperature and low humidity environment may facilitate its transmission in a community in the subtropical area (such as Hong Kong) during the spring and in air-conditioned environments. It may also explain why some Asian countries in the tropical area (such as Malaysia, Indonesia, or Thailand) with high temperature and high relative humidity environments did not have major community outbreaks of SARS(8,9). The seasonal nature in the outbreaks of respiratory virus infections is a common phenomenon, with peaks often occurring in low temperatures, during the winter months (8,9). The coronavirus can retain its infectivity for up to 2 weeks in a low temperature and low humidity environment, which might facilitate the virus transmission in a community located in a subtropical climate (2,8,9).

This epidemic has caused a collapse in health care services and economies of affected countries, and the overall mortality rate was estimated to be 4.7%, but in elderly patients, aged 60 or above, it can increase to 14.8% (13). A notable feature of SARS-CoV-2 is its predilection for transmission in the health care setting and to close family and social contacts by different manners, such as droplets, close direct or indirect contact, but the relative importance of these routes of transmission is still unclear (14). The mechanism underlying these patterns of climate determination that lead to infection and possible disease transmission is associated with the ability of the virus to survive external environmental conditions before staying in a host (2,8,9).

There have been some studies reporting an association between the SARS outbreak, metrological factors, and air pollution (15–17). The survival effects of these environmental factors on SARS coronavirus remain unclear. Chan K. H. et al (2011) (2) reported the stability of the SARS coronavirus at different temperatures and relative humidity. Many studies reported that infectivity of SARS CoV (SARS coronavirus) was lost after heating at 56∘C for 15 minutes but that it was stable for at least 2 days following drying on plastic. It was completely inactivated by common fixatives used in the laboratory (9, 10). Another study showed that it was inactivated by ultraviolet light, alkaline (pH > 12), or acidic (pH < 3) conditions (11). There have been some studies reporting an association between the SARS outbreak, metrological factors, and air pollution (15–17) Thus, information on the survival of the SARS coronavirus (SCV) in the environment at different temperature and humidity conditions is of significant interest in understanding virus transmission (2,8).

Restrictive preventive measures and policies are needed to control the COVID-19 outbreak. Increasing people's awareness is one potential measure to limit the spread of infectious diseases that المؤلف will have an impact on the economic, social, and mortality burdens of any infectious disease (8).

The preventive measures can include frequent hand washing, avoiding direct contact with infected patients, vaccination (if available), and wearing masks (10,11).

Changing people's behaviors and responses during disease outbreaks can reduce the size of the outbreak rather than eliminate the presence of the disease itself (18). Spreading awareness and health messages for contagious disease prevention could be achieved using various mechanisms, including through the media, public talks, and lectures. For example, spreading preventive knowledge through television was effective to control H1N1 influenza in the Mississippi Gulf Coast (19). Also, awareness campaigns, websites, and television were used for public education about SARS in Singapore (19).

Aims of the study:

1- The aim of the study to determine COVID-19 knowledge, attitudes, and practices of Libyan females in a different environment, in Libya, the USA, Canada, and other countries (Turkey, Egypt &UK),

2- To determine factors that affect the level of COVID-19 awareness among participants and its correlations with specific demographic characteristics and awareness of COVID-19.

Subjects and Methods:

Study design and settings: a cross-sectional descriptive research design was used.

The survey was conducted from 1st September until the 20th of October 2020.

Study population (inclusion and exclusion criteria)

The population evaluated consisted of all contacted individuals aged 18 years old, Libyan, and who were willing to participate in the survey.

The target populations all females living in Benghazi, Libya, or outside Libya (USA, Canada, UK, Egypt, and Turkey) at the time of survey friends of Facebook, and other social media.

Sample size: the sample size was 180 respondents.

Data collection: A pre-coded Arabic- languish questionnaire was used through media platforms (Facebook, WhatsApp, Viber, & telegram). The questionnaire is organized into two sections of basic characteristics of the respondents and the knowledge, attitude, and practices of the study population about covid-19 some environmental factors affecting covid-19, and the use of preventive measures.
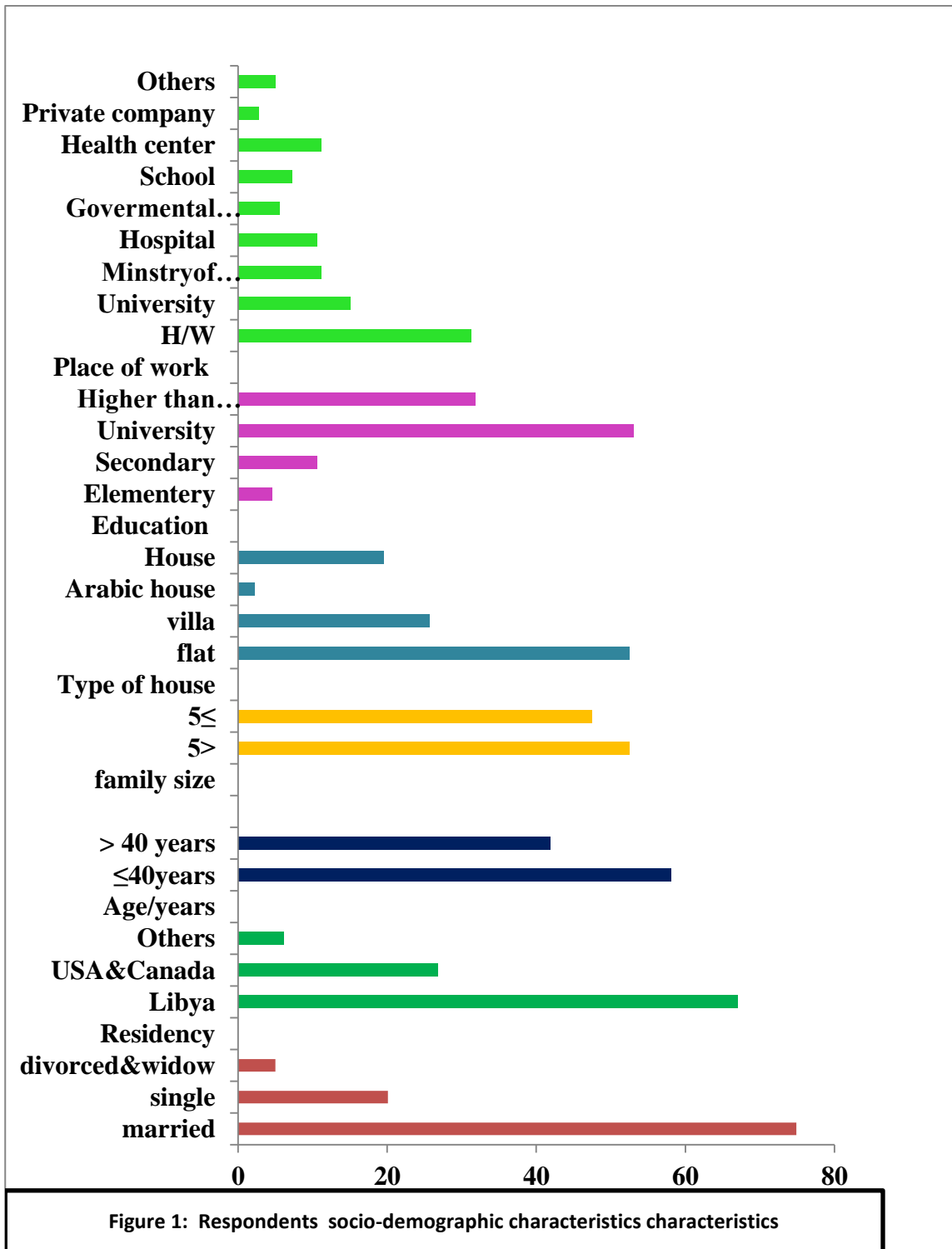
Ethical issues: Participation in the study was voluntary and the purpose of the study was explained before the survey began. If a participant agreed to give the feedback answer of the questionnaire, this was their consent to participate in the study. Participants' identities were not recorded, and confidentiality was assured.
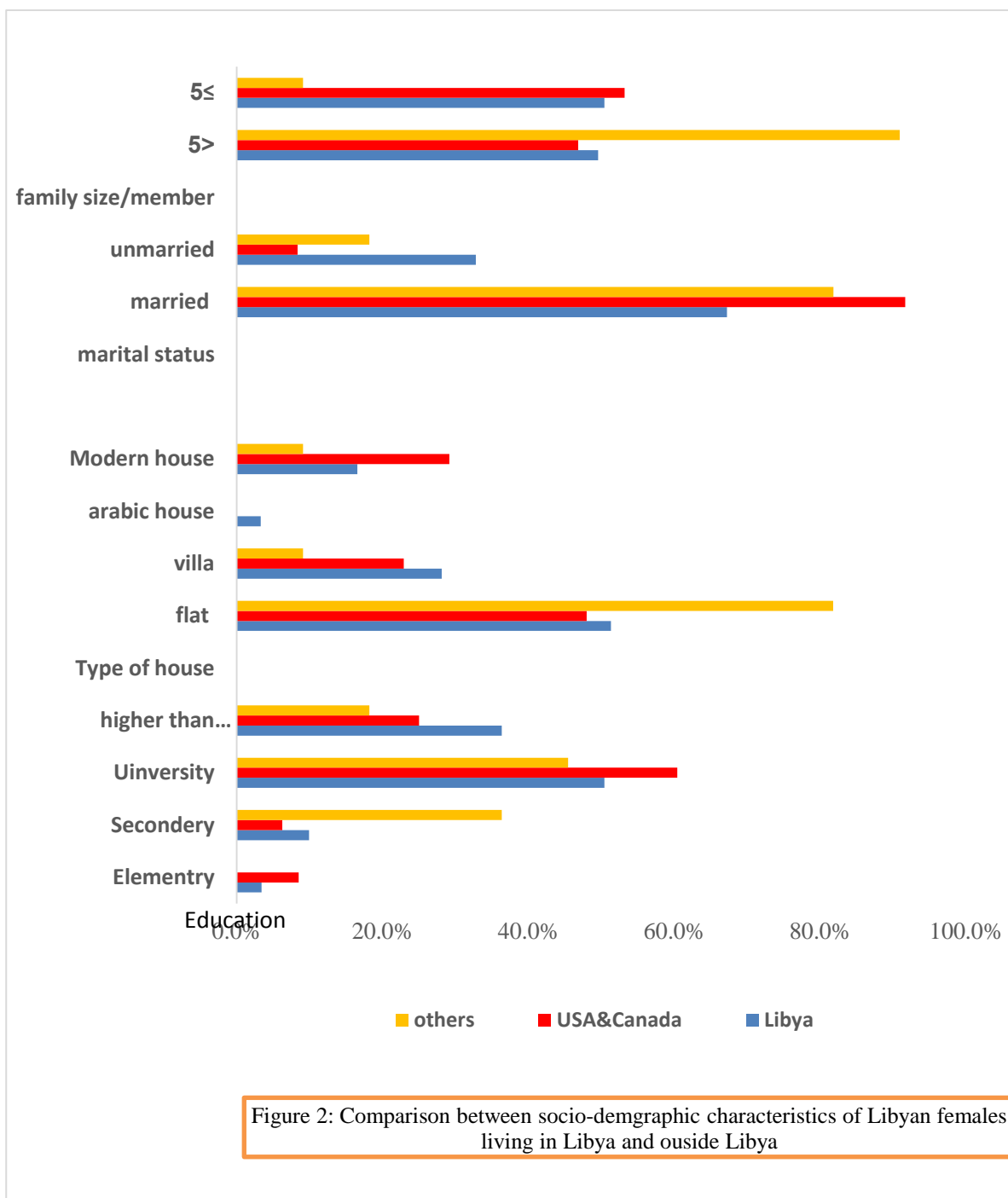
Statistical analysis: Data analysis was performed using SPSS version 25. Frequencies and percentages were used to display the qualitative variables, while the mean ± standard deviation (SD) was used to summarize the quantitative variables. Each participant's score was calculated as the percentage and 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.

Limitations: because of **the** novel coronavirus and due to restricted movements and Restrictive preventive measures, the researcher used google form through social media for data collection. In Libya, recurrent light cutoff interrupted the internet network so could not collect more sample.

Results

The demographic characteristics of the participants are displayed in figure 1. A total sample of 180 females participated in this study, 121(67%) from Libya, 48(26.8%) Libyan living in the USA and Canada, 11(6.1%) Libyan living in other countries (Egypt, Turkey &UK). The mean age was 38.8±11.05years, 104 (58.1%) ≤40 years old, and 75 (41.9%) were > 40 years. The current study reported that 4(2.2%) were illiterate,8(4.5%) had an elementary school,19 (10.6) had a secondary level of education, 95(53.1%) had university and 57(31.8%) had a higher education than university. The present study reported that 134(74.9%) of them were married, 35(19.9%) single, 94(52.5%) family size less than 5 members, and 85(47.5) had more than 5 family members. More than half 94 (52.5%) of respondents live in flats, 46(25.7%) live in the villa, and 35(19.6%) were living in houses. The current study revealed that 56(31.3%) were housewife (H/W), workers at university 27(15.1%), 20(11.2%) workers at the ministry of health and education, 20(11.2%) workers at health centers, and 19(10.6%) working at hospital Figure [1].

Figure 1: Respondents socio-demographic characteristics characteristics

Figure 2: Comparison between socio-demgraphic characteristics of Libyan females living in Libya and ouside Libya

The present study reported the socio-demographic characteristics according to the place of living, 134(74.9%) of them were married, 80(67.2%) were from Libya, 44(91.7%) from the USA and Canada, and 9 (81.8%) from other countries (UK, Egypt, and Turkey). As regarding the present study revealed that family size, was 59 (50.4%) and 25(53.2%)of those living in Libya and USA and Canada respectively had more than 5 members, while, 10 (90.9%) of those living in other countries had less than 5 family members. The majority of the sample had university or higher,105(86.8%) from Libya, 41(75.4%)of those living in the USA and Canada and 7(63.7%) of

those living in other countries figure 2. The current study found that8 (72.7%) of respondents living in other countries live in flats, slightly less than half 60 (49.6%) and 21(43.8%) of those living in Libya and USA and Canada live in flats. The current study revealed that 5 (45.5%) of respondents of those living in other countries, 16(33.3%) those live USA and Canada, and 35(28.9%) of those living in Libya Figure (2).

The present study reported that 96 (81.1%) of respondents from Libya and 9(81.1%) of respondents those living in other countries as compared to those living in the USA &Canada 34 (70.8%) had a satisfactory level of knowledge about coronavirus. About the source of knowledge, the News, News Paper and Media were the most popular source of knowledge of those respondents living in the other countries 6(54.5%) and 20(42.5%) of those living in USA &Canada as compared to 43(35.8%) of those respondents living in Libya. While 44(36.7%) of respondents living in Libya the social media was their source of knowledge as compared to 14(29.8%) of respondents living in USA &Canada and 2(18.2%) of respondents living in other countries figure (3). Workshop as a source of knowledge, 9(19.1%) was more common in USA &Canada and 2 (18.2%) among those respondents living in other countries as compared to 17 (14.2%)of those live in Libya (figure3).

Respondents attitude toward coronavirus (table 1):

The present study reported no significant difference in their attitude toward corona infection and place of residency. More than two-thirds of respondents 61(68.5%) of those who live in Libya agree that they may be get infected by a coronavirus, 48(26.8%) of those respondents live in the USA &Canada, and 11(6.1%) of those living in other countries (UK, Turkey & Egypt) where $X^2_{4=}6.402$&P=0.6. Nearly two-thirds 61(67.8%) of respondents in Libya, 24(26.7%) of those who live in the USA & Canada, and 5(5.6%) of those who live in the other countries agreed that the Sunlight exposure restricts the spread of coronavirus where $X^2_4=8.0$&P=0.24. Three quarters 56(74.7) of respondents in Libya, 17(22.7) and 2(2.7) of respondents living in the USA &Canada, and other countries respectively disagree that summer may help in the spread of coronavirus disease where ($X^2_4=7.32$&P=0.29). Two-third 44(66.7) of respondents in Libya, 18(27.3) of respondents from the USA & Canada, and 4(6.1) of respondents from other countries have disagreed that high humidity is a good media for the spread of coronavirus where ($X^2_4=2.53$&P=0.87).

The present study reported that 61(70.1%) of respondents from Libya, 21(24.1%) respondents from the USA & Canada, and 5(5.7%) of respondents from Other countries disagreed

that the use of antiseptic agents can cause congenital anomalies in the newborns where (X^2_4=5.66 &P=0.46).

The present study reported that 120(67%) respondents in Libya, 48(26.8%) USA & Canada, and 11(6.2%) of respondents from Other countries agreed that the use of pesticidal and chemicals in agriculture lead to the spread of coronavirus where (X^2_4=3.45&P=0.75)(table 1).

As regards the uses of protective measures during the corona epidemic the present study reported that 107(59.2%) of respondents always were using the protective measures and 72(40.8%) sometimes use protective measures. The current study reported no significant relationship between the place of residency and the use of protective measures table 2.
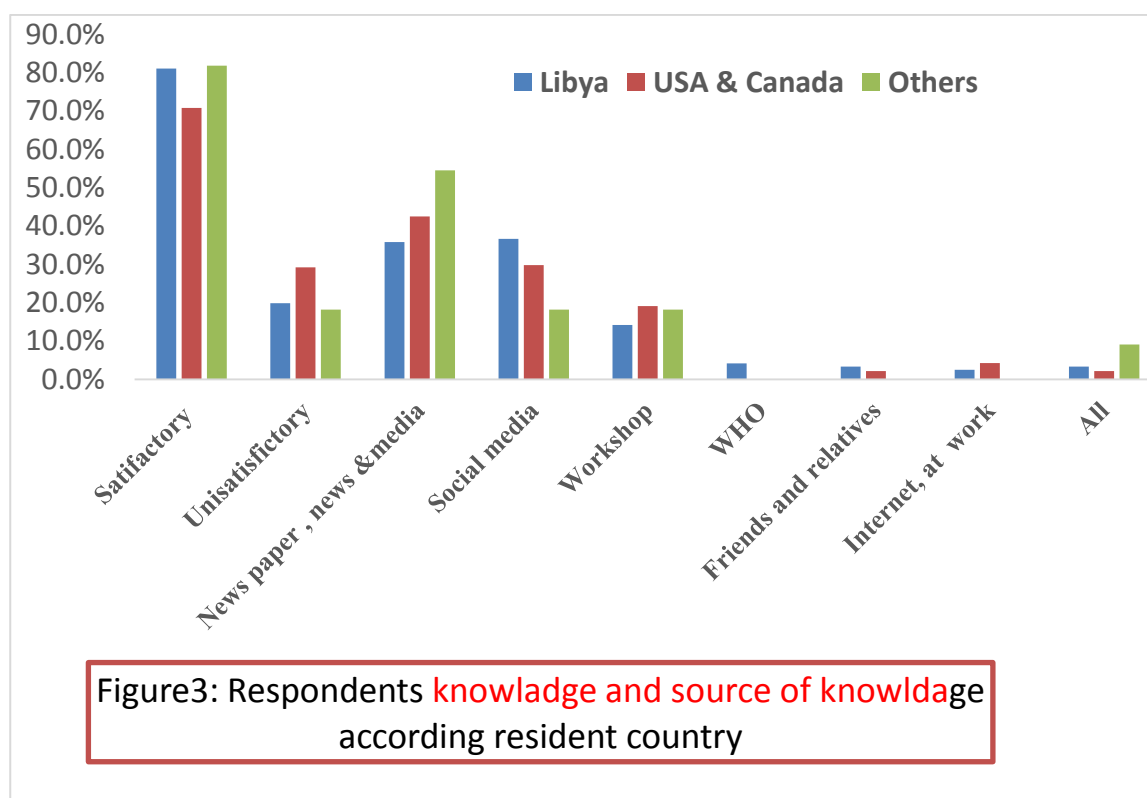

Figure3: Respondents knowladge and source of knowldage according resident country

Table 1: Respondents opinion about the relation of some environmental factors with covid-19 infection

1- Do you think you or any member of your family can be infected by covid-19?				
Country living in	disagree	neutral	agree	Total	Test of significant
▪ Libya	14(51.9)	45(71.4)	61(68.5)	120(67)	
▪ USA &CANADA	11(40.7)	15(23.9)	22(24.7)	48(26.8)	$X^2_{4=}6.402\&P=0.60$
▪ Others	2(7.4)	3(4.9)	6(6.7)	11(6.1)	
2- Do you think sunlight exposure restrict the spread of the corona virus				
▪ **Libya**	21(63.6)	39(68.5)	61(67.8)	120(67)	$X^2_4=8.0\&P=0.24$
▪ **USA &CANADA**	9(27.3)	15(27.8)	24(26.7)	48(26.8)	
▪ **Others**	3(9.1)	4(3.7)	5(5.6)	11(6.1)	
3- Do you think summer help in the spread of coronavirus disease?				
▪ **Libya**	56(74.7)	53(60.5)	13(65)	120(67)	
▪ **USA &CANADA**	17(22.7)	28(32.1)	4(20)	48(26.8)	$X^2_4=7.32\&P=0.29$
▪ **Others**	2(2.7)	6(7.4)	3(15)	11(6.2)	
4- Do you think use High humidity is a good media for the spread of corona?				
▪ **Libya**	26(76.5)	56(63)	44(66.7)	120(67)	
▪ **USA &CANADA**	6(17)	26(30.1)	18(27.3)	48(26.8)	$X^2_4=2.53\&P=0.87$
▪ **Others**	2(5.9)	5(6.8)	4(6.1)	11(6.1)	
5- Do you think using the use of antiseptic agents to prevent infection can cause congenital anomalies?				
▪ **Libya**	61(70.1)	45(62.5)	14(73.7)	120(67)	
▪ **USA &CANADA**	21(24.1)	25(31.9)	3(15.8)	48(26.8)	$X^2_4= 5.66\&P=0.46$
▪ **Others**	5(5.7)	4(5.6)	2(10.5)	11(6.1)	
6- Do you think the use of pesticidal and chemicals in agriculture lead to the spread of coronavirus?				
▪ **Libya**	81(64.8)	36(73.7)	7(58.3)	120(67)	$X^2_4=3.45\&P=0.75$
▪ **USA &CANADA**	36(28.8)	8(21.1)	4(33.3)	48(26.8)	
▪ **Others**	8(6.4)	2(5.3)	1(8.4)	11(6.2)	
▪ **Total**	125(69.8)	46(25.7)	12(6.7)	183(100)	

Table 2: Respondents uses of protective meaures aganist corna virus :

1- Do you do hand wash to prevent the spread of coronavirus?				
Place of residency :	**Always**	**Some times**	**Total**	
• Libya	108(67.5)	12(63.1)	120(67.1)	X^2_2=0.225
• USA&Canada	42(26.2)	6(31.6)	48(26.8)	&P=.89
• Others	10(6.3)	1(5.3)	11(6.1)	
2- Do you use nasal tissue paper during sneezing?				
• Libya	91(67.9)	29(64.4)	120(67.0)	X^2_2=.128
• USA &Canada	35(26.1)	13(28.9)	48(26.8)	P=.91
• Others	8(6.0)	3(6.7)	11(6.1)	
3- Do you use hand wash and antiseptics?				
Libya	84(71.8)	36(58.0)	120(67.1)	X^2_2=3.8
USA & Canada	26(22.2)	22(35.5)	48(26.8)	P=.149
Others	7(6.0)	4(6.5)	11(6.1)	
4- Do you put my shoes on to prevent the spread of coronavirus?				
Libya	72(67.2)	48(66.7)	120(67.0)	X^2_2=.112
USA & Canada	28(26.2)	20(27.8)	48(26.8)	P=0.95
Others	7(6.5)	4(5.6)	11(6.1)	
Total	107(59.8)	72(40.2)	179(100)	

Discussion :

Global data about the coronavirus epidemic and contagion, seem to suggest a significant link to the anthropic pressure, especially in terms of atmospheric pollution (20). The evolving outbreak of coronavirus disease 2019 (COVID-19) is requiring social distancing and other measures to protect public health (21).

The present study reported that (81.1%) of respondents from Libya and (81.1%) of respondents living in other countries as compared to those living in the USA &Canada (70.8%) had a satisfactory level of knowledge about the corona virus. Bonyan et al (2020)[22] surveyed covid-19 awareness in Arabic-speaking countries (Jordan, United Arab Emirates, the Kingdom of Saudi Arabia, Qatar, Palestine, and Egypt). In general, the overall level of awareness of COVID-19 causes and prevention was good (22).

The present study reported that the News, News Paper and Media were the most popular sources of knowledge of those respondents living in the other countries 6(54.5%) and 20 (42.5%) of those living in USA &Canada as compared to 43(35.8%) of those respondents living in Libya. While (36.7%) of respondents living in Libya the social media was their source of knowledge as compared to (29.8%) of respondents living in the USA &Canada and (18.2%) of respondents living in other countries

Bonyan et al (2020)(22) reported that the main source of information about COVID-19in Arab countries was social media (76.3%), followed by awareness campaigns (39.2%) and television (35.9%). This is a logical finding because social media has become a feature of everyday life due to the widespread use of the Internet and smartphones. This was similar to the finding of a previous study that found that knowledge about MERS (another disease caused by a coronavirus) was mainly obtained from social media (23). However, using social media as the main source of information may adversely affect individuals' approaches toward preventive behaviors for infectious diseases because the information shared in social media is provided by non-specialized people and is not scientifically reviewed (24).

Asaad A et al (2020) (25) found that 50% of the participants depended on the Ministry of Health website as the main source of information about MERS. This differs from the findings of previously published studies, where social media and television were the main sources of information (26,27,28,29,30). This indicates that the educational materials posted online by the Ministry of Health encouraged the busy HCWs to use them. At the same time, it sets a great

responsibility on health care authorities to increase the accessibility of such materials by varying the means of information delivery, aiming to improve knowledge levels. A finding of considerable concern is that 36% of HCWs used social media as a source of information.

Rising population awareness is one of the most important measures to limit the spread of infectious disease that will have an impact on the economic, social, and mortality burdens (31) These measures can include frequent hand washing, avoiding direct contact with infected patients, vaccination (if available), and wearing masks (22).

The present study reported that overall 59.2% of respondents always were using the protective measures. 71.8% of respondents living in Libya always did handwashing and antiseptics as compared to 22.2% and 6.0% of those respondents from the USA Canada and other countries respectively.

Conclusion: from the analysis of the study we concluded that no significant differences in the knowledge and attitudes of respondents from inside or outside Libya as coronavirus as concerned. On the other hand, there were differences in the sources of knowledge, the respondents from Libya majority of them their source of knowledge where social media as compared to those respondents from outside Libya the main sources of knowledge were news and newspaper. Recommendations: we recommend improvements in public awareness about COVID-19 should be considered. Improving public awareness should be spearheaded by reliable health and governmental sectors. Social media, awareness campaigns, and television are extremely helpful platforms that should be adopted by decision-makers in each country to raise community awareness and preventive attitudes toward COVID-19. the collaboration between the ministry of health and residents of every country plays a critical role in containing the COVID-19 pandemic. More research on the bigger sample and longer time needed to have more precise results.

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