Knowledge, attitude and practices related to COVID-19 among young Lebanese population

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Abstract

Background: As the world faces the most serious and widespread pandemic in recent history, claiming nearly 700,000 lives and infecting close to 17 million individuals, controlling the spread of COVID-19 is still limited to efforts done by the general population implementing rules and restrictions passed by world governments and organizations. Awaiting the development of a cure or a vaccine, the best approach to fighting the spread of this disease is mostly preventative depending largely on individuals' compliance. This study aims to test the KAP towards COVID-19 in Lebanon.

Methods: A cross-sectional study of Lebanese population comprising of 1861 participants was used to analyze the knowledge, attitude and practices of individuals concerning COVID-19 in relationship to multiple variables such as age, gender, marital status, living area, education level, occupation in addition to their degree of worrying about this disease.

Results: Our participants showed an overall appropriate knowledge (67.1%), positive attitude and practices that ranged from fair to very good, depending on its type, regarding COVID-19. When the components of KAP were analyzed with respect to variables, we found that levels of knowledge and practices positively correlated with people who were ever married, older, with higher degrees, worked in a healthcare field and with the degree of worry about getting COVID-19.

Conclusions: In the absence of a vaccine, pandemics such as the current COVID-19 are best combatted by increasing public awareness leading to collective preventative practices. A key factor in this effort lies in creating a good environment that enhances people's compliance with considerate pandemic behavioral rules in which governing bodies must be pivotal.

Background

The world is currently facing a serious pandemic caused by the novel coronavirus (2019-nCoV) that was first isolated on December 21, 2019 [1] from patients who were in contact with the Huanan Seafood Market (in Wuhan, China) which is widely known to be the origin of this pandemic [2]. This virus has since been renamed to SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) following the most recent world health organization (WHO) guidelines [3]. Bats are the primary suspect of being the potential natural reservoir of SARS-CoV-2; whereas pangolins could be the possible intermediate host of this virus to humans [4].

Corona virus disease 2019 (COVID-19) which is caused by SARS-CoV-2 is reported by the WHO to be triggered by the inhalation of contaminated droplets with viral particles, or by touching the nose, mouth and eyes after being in contact with contaminated surfaces. In addition, transmission via aerosols and through fecal oral routes are also suspected. Among the most described symptoms of COVID-19 are fever, cough, sore throat, shortness of breath, pneumonia, fatigue, malaise, gastrointestinal symptoms. At the same time, infection by the SARS-CoV-2 can be asymptomatic [4].

To the time of submission of this manuscript, a worldwide total of 16,558,289 confirmed infected cases with SARS-CoV-2 are reported by the WHO, among them 656,093 deaths because of COVID-19 (mortality rate of 3.96%) [5]. In the eastern Mediterranean region, WHO reports 1,507,734 cases and 38,815 deaths (mortality rate of 2.57%). The first confirmed case infected with SARS-CoV-2 was diagnosed in Lebanon on February 21 2020 where, up to July 29, the total number of people positive for SARS-CoV-2 is 4,023 with 54 total deaths (1.34% mortality rate) [5]. In Lebanon, In March and April, on average, 11.77 new confirmed cases per day was reported by the WHO. In the last two weeks, these numbers have alarmingly risen to 105.56 new cases per day signalling an increasingly alarming situation in this country [5].

Shortly after the pandemic reached Lebanon, the Lebanese Ministry of Public Health (MOPH) devised a policy to control the spread of the SARS-Cov-2 within the population which was in alignment with those of the WHO [6,7]. The published policy regarding the general population are summarized hereafter: i) to regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water, ii) maintain at least 1 meter (3 feet) distance between yourself and others, iii) avoid going to crowded places, iv) avoid touching eyes, nose and mouth, v) covering mouth and nose with the bent elbow or tissue when you cough or sneeze, then dispose of the used tissue immediately and wash your hands, vi) stay home and self-isolate even with minor symptoms such as cough, headache, mild fever, until you recover while asking someone to bring you supplies., vii) wear a mask to avoid infecting others if you need to leave your house, viii) seek medical attention, but call by telephone in advance if possible and follow the directions of your local health authority if you have a fever, cough and difficulty breathing.

More than six months have passed since the beginning of this worldwide threat and the discovery of a vaccine or cure for COVID-19 remains elusive. There are many tests to check for SARS- CoV-2; however, the accuracy of these tests are not reassuring with yet high percentages of false negatives/positives results depending on the test types [8, 9]. With this in mind, prevention seems to be the only actionable plan at the moment to slow down the spread of this virus. Prevention naturally depends on controlling the spread the infection from the already infected patients to the general population. This requires clear and decisive measures by governments and communities on (1) how to correctly identify COVID-19 patients, (2) how to quarantine and treat them and (3) how to educate the populace about appropriate measures to control its spread. This requires appropriate knowledge, attitude and practices (KAP) at the level of healthcare workers (HCW) as well as the general populace. Many studies have shown that healthcare workers show adequate KAP towards corona viruses of respiratory system transmission including COVID-19 [10, 11 &12]. This is not surprising since HCW have better access to informed data and KAP about protection from the spread of infectious diseases. At the same time, HCW have better access to protective gear as provided by their workplace. It is thus crucial to assess the KAP at the level of the general population. An assessment that will allow for a better understanding of the current KAP indicators and the gaps thereof in the general population which would aid in the design of public policies to control COVID-19 spread until a cure or vaccine is discovered. To our knowledge, this is the first KAP study in Lebanon to check for awareness towards COVID-19 spread among the Lebanese population.

Methods

Study design and Data collection

The current study was based on a cross-sectional survey conducted between April 10 and May 5, 2020 in Lebanon. A structured questionnaire was designed and developed by the research team. Some questions were based on previous studies with the needed adjustment to match our aim [13, 14, 15] and others were self-created by the research team. The questionnaire was shared through social media (Facebook, Instagram and LinkedIn) through the accounts of the members of the research teams with all our contacts and friends. In many cases, some of our friends did share the invite to this study on their accounts as well. This fact made it difficult to collect the total number of individuals who could have received this questionnaire in order for us to calculate the response rate for our study. In addition, E-mails and the chatting group “WhatsApp” were also used to disseminate this questionnaire to potential participants.

A pilot study on 22 individuals was conducted to check the reliability of the questionnaire. Based on the results of the pilot study, modifications has been applied to adjust the questionnaire based on the Lebanese context. The questionnaire reliability was assessed by calculating the alpha-Cronbach's coefficients, which were acceptable for the three dimensions of the questionnaire (knowledge: alpha-Cronbach=0.61, attitude: alpha-Cronbach=0.66 and practices: alpha-Cronbach=0.64). A total of 1,861 different responses to the questionnaire has been collected.

Variables

The questionnaire consisted of four sections: socio-demographics, knowledge, attitude and practices towards COVID-19. Participants' socio-demographic characteristics consisted of 6 questions including gender, age, marital status, residence, education and employment. Knowledge consisted of 10 questions including related to the source of SARS- Cov-2 virus, transmission routes, sources of information, target human system, incubation period, possible symptoms, patients recovery, risk groups, and 2 questions related to assessing the relation between symptoms and vaccine of corona virus with influenza viruses. An example of questions about knowledge would be “How is COVID-19 transmitted from one person to another?”. Attitude section of the questionnaire consisted of 7 questions for example “Are you worried that you or one of your family members would catch the COVID- 19?”, and practices section was composed of 10 question such as “Are you disinfecting food you are buying during the COVID-19 pandemic?”

For the questions related to knowledge, participants scored 0 on each question with the wrong answer and 1 for each question with the right answer in all questions except the three questions that included more than one correct answer. In the three questions that included more than one correct answer about knowledge, participants scored 1 (good knowledge) if they answered 3 or more out of 5 correct answers, scored 0.5 (average knowledge) if they answered 1-2 correct answers and scored 0 (poor knowledge) if they did

not guess any of the correct answers. Answers to questions related to frequency of practices were scored on a 4 point Likert scale (1: always and 4: never). The sum of scores was calculated for the two dimensions of knowledge and practices considering the sum of the score for each individual question in each dimension.

Statistical analysis

Descriptive statistics showed the frequency and percentage (%) of participants who answered right for the different questions related to socio-demographic characteristics, knowledge, attitudes and practices towards antibiotics use. T-student test of independence was used to compare the average score in the two domains of knowledge and practices between the participants according to their socio-demographic characteristics and according to their attitudes (worried or not about getting infected with COVID-19).

Results

Socio-demographic characteristics of the participants are displayed in Table 1. The majority of participants are males (73.7%), single (66.6%), live in urban areas (60%), hold university degrees or higher (78.4%). The participants included many students (41%) and about 50% of participants are between the age of 18-24 years old during the collection of data period. Only 10.5% had at least an acquaintance who was diagnosed with COVID-19.

Table 2 shows the frequency and percentage of participants who had correct answers for each of the items related to knowledge and attitude regarding COVID-19. It is worth noting that the great majority of participants have good knowledge about the body system affected by COVID-19 (97.4%), while only a 15.4% of participants know about the incubation period for its causing virus. Around 77% of participants are able to differentiate between COVID-19 and common influenza in terms of symptoms and vaccine effectiveness. As for mode of transmission and groups at high fatality risk, a high percentage of participants show good knowledge (61.5 and 62.7%, respectively).

The great majority was found to perceive that infection by COVID-19 is dangerous and that is it important to isolate the cases (97.9 and 97.1%, respectively). The majority were also optimistic about the possibility to find treatment and vaccine to COVID-19 (90.3% and 88.2% respectively). When it comes to trust in the measures taken by the local government to contain the epidemic, only 19.5% do not have trust, while 27.8% were uncertain, and the remaining 52.7% had complete trust in the government implemented measures.

Table 3 shows the frequency of practicing preventive measures among participants. The table shows that participants practiced preventive measures to a good extent. The majority of participants answered that they always washed their hands and avoided public places (76.6 and 74.3%, respectively), and disinfect money and food (49 and 66%, respectively). On the other hand, a high percentage (39.2%) answered that they always use personal protective equipment (PPE, such as face/shields and gloves), disinfect shoes and disinfect cloths (49.2 and 46.8%, respectively). Only a small percentage of participants always go out and always eat raw meat (15.1% and 6.4%). Additionally, 97.8% of participants know the ingredients of the disinfectant they use.

Table 4 shows the average knowledge and practices scores per socio-demographic variables and attitudes. Married participants, older age groups, participants in urban areas and those with higher education and health care workers had better knowledge scores than the other participants (statistically significant associations). However, although females and those who worry about getting infected with COVID-19 had better knowledge scores, the associations were not statistically significant.

On the other hand, males, married, higher age groups, those with higher education and health care workers and those who worry about getting infected had more frequent practices (lower scores) than the other groups, (statistically significant associations).

Table 1 Socio-demographic characteristics of participants (n=1882)

Socio-demographic characteristics	Frequency (%)
<i>Sex</i>	
Female	494 (26.2%)
Male	1387 (73.7%)
<i>Age</i>	
18-24	928 (49.4%)
25-34	460 (24.4%)
35-44	287 (15.2%)
45-54	130 (6.9%)
55-64	59 (3.1%)
65 or more	18 (1%)
<i>Marital Status</i>	
Single	1253 (66.6%)
Married	577 (30.7%)
Divorced	42 (2.2%)
Widowed	10 (0.5%)
<i>Residence</i>	
Rural	752 (40)
Urban	1130 (60%)
<i>Education</i>	
Elementary or less	87 (4.6%)
Senior High (grades 10-12)	337 (17.9%)
B.S/ B.A	823 (43.7%)
Postgraduate	635 (33.7%)
<i>Occupation</i>	
Unemployed	90 (4.8%)
University student	774 (41.1%)
Medical/ health field	174 (9.2%)
Office work (lawyer, sales, education)	651 (34.6%)
Construction	193 (10.3%)

Table 2 Number and percentage of participants' answers for questions related to knowledge and attitude towards COVID-19

<i>Knowledge</i>	n (%)
Cause of COVID-19	1806 (96%)
Mode of transmission of COVID-19	Good knowledge 1156 (61.5%) Fair knowledge 104 (5.5%) Poor knowledge 621 (33%)
Body organ/system affected	1834 (97.4%)
Symptoms caused by COVID-19	Good knowledge 1018 (54.7%) Fair knowledge 161 (8.7%) Poor knowledge 682 (36.6%)
COVID-19 first found	643 (34.2%)
Incubation period	290 (15.4%)
Possibility of recovery from COVID-19	1777 (94.4%)
Groups at high fatality risk	Good knowledge 1179 (62.7%) Fair knowledge 95 (5.1%) Poor knowledge 607 (32.3%)
Similarity in symptoms to influenza virus	1458 (77.5%)
Ability of influenza vaccine to protect against COVID-19	1459 (77.5%)
<i>Attitude</i>	
Perception of danger of infection by COVID-19	Always 349 (18.5%) Some cases 1494 (79.4%)
Concerns to catch COVID-19 (self or family)	1567 (83.3%)
Readiness to take vaccine (if available)	1304 (69.3%)
Trust in sufficiency of measures taken by government	Yes 993 (52.7%) Maybe 523 (27.8%)

Importance of Isolation of COVID-19 cases	1827 (97.1%)
Optimism about possibility to find a treatment to COVID-19	1700 (90.3%)
Optimism about possibility to find a vaccine to COVID-19	1660 (88.2%)

Table 3 Percentage of participants as per frequency of preventive practices

<i>Practices</i>	Always	Often	Occasionally	Never
P1. Washing hands frequently with soap and water	1441 (76.6%)	197 (10.5%)	101 (5.4%)	142 (7.5%)
P1. Avoiding crowds and public places	1398 (74.3%)	215 (11.4%)	95 (5%)	173 (9.2%)
P2. Using personal protective equipment	737 (39.2%)	545 (29%)	405 (21.5%)	194 (10.3%)
P3. Disinfecting shoes after going out	926 (49.2%)	381 (20.2%)	297 (15.8%)	277 (14.7%)
P4. Disinfecting cloths after going out	881 (46.8%)	465 (24.7%)	329 (17.5%)	206 (10.9%)
P5. Disinfecting money	923 (49%)	410 (21.8%)	271 (14.4%)	277 (14.7%)
P6. Frequency of going out	285 (15.1%)	282 (15%)	789 (41.9%)	522 (27.7%)
P7. Disinfecting food packages	1250 (66.4%)	N/A	488 (25%)	142 (7.5%)
P8. Eating raw meat	121 (6.4%)	N/A	191 (10.1%)	1568 (83.3%)

Table 4 Mean knowledge and practices with socio-demographic variables and attitudes. Only statistically significant associations are shown

	Knowledge Mean (S.E.)	p-value	Practices Mean (S.E.)	p-value
<i>Gender</i>				
Male	6.84 (1.35)	0.13	16.69 (4.67)	0.01
Female	6.96 (1.34)		17.28 (4.51)	
<i>Marital status</i>				
Single	6.75 (1.37)	≤0.001	17.26 (4.73)	≤0.001
Ever married	7.27 (1.27)		16.03 (4.29)	
<i>Age</i>				
18-24	6.60 (0.89)	≤0.001	17.32 (3.85)	≤0.001
25-34	7.09 (1.12)		16.68 (4.11)	
≥35	7.22 (1.32)		16.15 (4.28)	
<i>Live</i>				
Rural	6.7416 (1.55)	0.004	16.98 (3.76)	0.287
Urban	7.16 (1.02)		16.75 (4.27)	
<i>Educational</i>				
Below B.S.	6.78 (0.97)	0.01	17.01 (4.55)	0.03
B.S. or post-grad	7.11 (1.23)		16.43 (3.67)	
<i>Occupation</i>				
University student	7.29 (1.12)	≤0.001	16.11 (3.43)	≤0.001
Healthcare workers	7.88 (0.76)		15.44 (2.89)	
Others	6.52 (1.34)		17.43 (3.54)	
<i>Worry about getting infected with COVID-19</i>				
Yes	6.89 (0.77)	0.02	16.79 (3.28)	≤0.001
No	6.78 (0.86)		17.16 (3.76)	

S.E.: Standard Error

Discussion

Respondents participating in our study answered correctly at an overall average of 67.1% to the questions regarding knowledge of SARS-Cov-2 and COVID-19. However, we found significant deviation from the average depending on the questions asked. Questions about mode of transmission, symptoms, population groups at higher risk and the difference between COVID-19 and the flu were around average (61.5, 54.7, 62.7 and 77.5%, respectively). Questions about the incubation period and the date of the first cases were answered correctly significantly below the overall average (15.4% and 34.2%, respectively). While questions regarding the cause of COVID-19, the target body system and its recovery rate were answered correctly at a much higher rate (96, 97.4 and 94.4%, respectively). It might be worth noting that at the time of the collection of data for this study, the predominant opinion about the body system affected in COVID-19 was the respiratory since very scarce information was out implicating other body organs or systems such as blood coagulation [16] and the digestive system [17]. Hence, the appropriate knowledge regarding the afflicted

organ was marked based on the widely accepted target system at that time. Even if we excluded the answers to the incubation period, our overall average for the knowledge questions will still be at 73% which could be considered as good especially when we compare our averages with similar studies done elsewhere. For example, the overall correct rate of the knowledge questions in China is 90% [18]; in Malaysia the average was 80.5% [19] and in Saudi Arabia it was 81.64% [20]. Our knowledge averages were lower than the aforementioned studies although in our case the data collection was done at a much later time, a time at which global public awareness towards COVID-19 was on the rise. On the other hand, a similar study in Bangladesh found that the correct knowledge average was 54.87% which was less than our findings [21] while another study conducted in Egypt obtained almost the same correct knowledge percentage (71.2%) [22].

Our participants had positive overall attitude towards COVID-19; particularly, the isolation of the COVID-19 cases, optimism about finding a treatment and developing a vaccine (97.1, 90.3, and 88.2%, respectively). This is similar to the attitude of participants in relevant studies [18,19]. However, our sample showed concern about catching the disease (83.3%) and did not seem to have trust in the measures taken by the Lebanese government to manage the COVID-19 epidemic (only 52.7% showed positive attitude towards this question). This latter finding was in sharp contrast with other results where the trust in the country/government of China and Malaysia were 97.1 and 89.9%, respectively [18,19].

Our sample participants did not exhibit in high percentages good practices. Only 76.6% washed their hands frequently with soap and water which is less than what others have found in similar studies [19]. Regarding the use of personal protective equipment (PPE), such as gloves, masks or face shields, we found that only 39.2% of our sample always used them. This is a low percentage when compared to the 98.0% of people always wearing facemasks when going out in the Chinese study [18]; 95.45% in Bangladesh [21] and even the 51.2% that was found by Azlan et al. 2020 [19]. Such a low percentage in our study could be attributed to the lack of clear public policy by the Lebanese government which did not impose PPE's at the time our data was collected (the government implemented the lock down and prevention campaign at the time where this survey was conducted but the control of the implementation of this strategy was not strict). Similar to what others have found regarding social distancing [19], our sample did observe acceptable social distancing with 74.3% avoiding crowded places and only 15.1% stating that they always went out in spite of the epidemic. At the same time, we found that around half of our sampled participants did disinfect personal items after being out such as their clothes, shoes, and money; while we found 66.4% to disinfect packaged food items they would bring home.

The levels of knowledge and practices we found were significantly higher in people who were ever married, older, with higher education levels, worked in the healthcare sector or related areas and with how much they worry about getting COVID-19. People living in urban areas had significantly better knowledge than those in rural areas without showing a significant difference in practices. Also, gender was not found as a significant factor for knowledge in our studies sample; however, practices were found to be significantly better in males. In most of the studies conducted in this subject, males typically showed less knowledge, and attitudes as well as exhibited less cautionary practices compared to females [18, 20, 21, 23]. Although one of these studies was done in a culturally similar environment to the one we have here, we cannot be certain to why we would find that males and females showed insignificantly different knowledge levels with males having better practices. Although this finding needs further investigation, we think that the fact that during the time of data collection, most of the males in this survey may have been obliged to go out to work since many families in Lebanon rely mainly of males for income in the absence of any financial assistance from the government. If accurate, this would explain why in this study men were found to have good knowledge compared to females and significantly better practices.

Our findings indicate that the educational background and occupation (the different healthcare fields) correlated positively with knowledge and practices. This finding is not surprising since higher educational degrees (in medical areas) and healthcare professions are associated with good KAP in most epidemic diseases including COVID-19 [18, 23, 24, 25 & 26]. Although the number of healthcare workers surveyed in this study was not very significant, this was to our knowledge the first study to include healthcare workers and non healthcare workers in the same questionnaires being asked the same questions and the data analysed with the same parameters. In spite of the aforementioned shortcoming in numbers, we here cautiously say that healthcare workers exhibited better KAP regarding COVID-19.

One final parameter we looked at regarding knowledge and practices towards COVID-19 was the attitude parameter of how worried our participants were about getting infected. Indeed, we found that being worried about the possibility of being infected with the COVID-19 causing virus does significantly associate with higher knowledge and better practices as has been found elsewhere [27].

On the other hand, it was found that people with health complications and serious concern about getting COVID-19 did not have better knowledge and attitude [28].

Limitations of the Study

This study had few limitation, the main ones being the selection bias related to the surveying method which excluded all uneducated, illiterate, and less technologically savvy individuals. As such, our study included the population sample composed of individuals who were mostly young adults, educated and literate. At the same time, since most participants had a good level of education (95.4% had at least high school degrees or above) and had a second language (English, as a second language) our results may have been skewed towards these two factors. This is unfortunate since the uneducated and elderly might be more susceptible to this disease and therefore should be investigated using a different method.

Policy implications

Based on the preceding, we suggest further studies into the mechanisms of transmission and dissemination of information to the Lebanese population to try to assess the points of weakness that need to be improved in order to enhance the knowledge of the general populace towards COVID-19 or pandemic level diseases. This should include a detailed analysis of the different media tools and their access by the different socio-demographic tiers of the population.

We would also recommend that governments work towards gaining more trust among the population by putting in place a transparent and a more reassuring public health plan to ensure public safety. It will be interesting to study the comparative KAP of populations in different governments with different economic capabilities to see if having a stronger economy would affect the attitude and eventually the practices of the population in pandemics. Since the world has seen two different examples of how governments supported their people through financial assistance or the lack of it – as happened in Lebanon where the government proposed but barely distributed a very small financial assistance, coupled with unemployment reaching 11.4% many were forced to work in conditions even if they didn't observe the recommended social distancing [29]- it would, therefore, be recommended for organizations such as WHO to direct more effort towards countries with suffering economies.

Finally, it is our opinion that practices should have been better in Lebanon had the governing bodies in this country been more adamant about enforcing the implementation of rules such as the mandatory wearing of PPE's and social distancing in public places. We did personally know about cases of social gatherings (weddings, funerals and others) taking place without having any intervention by any of the law enforcement agencies in Lebanon.

List Of Abbreviations

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2; COVID-19: Corona virus disease 2019; KAP: Knowledge, attitude and practices; WHO: World Health Organization; MOPH: Ministry of Public Health.

Declarations

Ethics approval and consent to participate

This study followed the ethical principles of the Declaration of Helsinki. A consent form was included in the questionnaire explaining the research objectives and assuring the anonymity and confidentiality of participants. The said form states that any participation in this study is entirely voluntary and has no consequence on its participants. This study was reviewed and approved by the Lebanese International University Institutional Review Board (IRB) ethical committee (Reference LIUIRB-200318-SS1).

Consent for publication

Not applicable.

Availability of data and materials

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

Competing interests

All authors declare that they have no competing interests.

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Authors' contributions

SS, ISh and BH designed the study. AG analysed and interpreted the data. AG, SS and BH drafted the manuscript. All authors have approved the final version of manuscript.

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