

A Crisis within a Crisis: An Assessment of COVID-19 Attitude and Practice among Syrians - A Cross-sectional Study

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Abstract

Introduction: COVID-19 has overwhelmed public healthcare systems worldwide, exacted substantial economic burden, and forced governments to impose partial or complete lockdowns of entire countries with stringent infection control measures to curb the spread of the virus. This study aimed to reflect the Syrian public's adherence to infection control measures by assessing their attitude and practice during this outbreak embedded within the war in Syria.

Methods: This web-based cross-sectional study was distributed randomly in March 2020, nearly 11 years into the Syrian war crisis. The survey consists of 3 sections: socio-demographic characteristics, attitude, and practice. Multivariable logistic regression analysis was performed to identify factors associated with good practice, and negative attitude. Data were analyzed using the Statistical Package for Social Sciences version 25.0.

Results: Of the 3586 participants, 68.2% were females, 50.8% were unemployed, and 79.2% were college-educated. Only 1402(39.1%) participants were wearing face masks when leaving their homes. Multiple logistic regression analysis revealed that female gender, age, and residence were factors associated with good practice towards avoiding mass gatherings, wearing face masks, and maintaining a 1-meter interpersonal distance; however, age and occupation were factors associated with a negative attitude towards the closure of universities and schools, travel ban, and quarantine for travelers.

Conclusion: This survey sheds light on the need for multiple measures to address targeted populations; there must be a specialized method of prevention for each occupation, age group, and place of residence to prevent the outbreak of COVID-19.

Introduction

Since the first incidence of Coronavirus disease 2019 (COVID-19) was reported at a local seafood market in Wuhan, China,(1) COVID-19 has had a profound shock on our societies and economies. The virus continues to spread resulting in growing morbidity and mortality cases, hitting the poorest and most vulnerable in the world.(2) On 30 January 2020, the World Health Organization (WHO) declared for the sixth time that COVID-19 outbreak is a public health emergency of international concern (PHEIC), prompting the organization to adopt and stipulate drastic global measures to stem the tide of the pandemic.(2, 3)

The COVID-19 pandemic forced governments around the world to coerce their citizens to comply with preventive health practices to reduce the infection rates. Individuals were obligated to adhere to constraining behavior, including isolation, social distancing, avoid mixing with seniors, wearing masks, and high standards of hygiene. Although these acts are restricting personal freedom, these practices generate health benefits for both the individual and the entire society. These measures lower contact probabilities with vulnerable populations, especially seniors or those immunocompromised; preventing hospitals from reaching their maximum threshold capacity, flattening the infection curve, and lowering its peaks.(4)

Syria has endured 10 years of conflict, resulting in the worst refugee crisis since World War II, in addition this pandemic has brought about new struggles.(5) The first confirmed case was announced on March 22,(6) neighboring countries such as Iran (21628 and 1685), Turkey (1236 and 30), Iraq (233 and 19), Lebanon (248 and 4), and Jordan (122 and 0) showed higher numbers at that time. The Syrian healthcare system is severely damaged and lacks the capacity to contain such a crisis. The estimated number of intensive care unit (ICU) beds with ventilators is a mere 325, and the theoretical maximum number of cases that can be adequately treated is barely 6,500.(7) Once this threshold is exceeded, drastic rationing decisions must be made. Therefore, cooperation with and response to guidance from the WHO and other organizations are of utmost priority. Unprecedented measures have been adopted to control the spread of COVID-19 in Syria including: isolation and care of suspected and infected individuals; curfews to limit social contact; partial closure of borders; suspension of public transportation; and closure of mosques, shops, parks, restaurants universities, and schools. The public's adherence to these control measures- which is largely affected by their attitudes and practices towards COVID-19- is crucial to mitigating the further spread of the disease. These challenges along with the dense residential areas, impact of war on education systems, and 83% of the population living under the poverty line make Syria highly vulnerable to a severe outbreak.(7, 8)

While a study has been conducted at the same institution (Syrian Private University) to assess the knowledge among Syrians, none have done so regarding the attitude and practices among our citizens during this pandemic.(9) To our knowledge, this is the first study that aims to assess the attitudes and practices of COVID-19 among the Syrian population at a time where ambiguity and misinformation are rampant. The objective of this study is to identify factors associated with negative attitude and good practice to help facilitate outbreak management in Syria during this rapid global rise of the COVID-19 pandemic.

Methods

Study design, setting, and participants:

This web-based cross-sectional survey was conducted over 4 days between March and April. The inclusion criteria for this study were that participants be Syrian residents with no known history of COVID-19 infection, who fully completed the survey. Questions were designed from several existing surveys used in similar studies.(10, 11) The survey was translated to Arabic and was reviewed by two dialectologists and two infectious disease specialists, who evaluated whether the survey questions effectively assessed COVID-19 attitude and practice, and checked for double-barreled and confusing questions, to ascertain the validity. A pilot study was conducted on 20 individuals to assess relevance, clarity, and the acceptability of the survey; these were excluded from the final sample to avoid bias. Modifications were made based on feedback received to facilitate better comprehension before distributing the final survey to the general population. The Arabic-language survey was posted on various social media platforms including Facebook, Instagram, Telegram, and WhatsApp. Participation was voluntary and was confirmed by answering a yes-no question. Participants were informed of the option to opt-out of the survey at any time and were assured of the anonymity and confidentiality of their responses. Participants were then directed to the first section of the survey to complete questions about socio-demographic information including, age, gender, residence, education level, occupation, and economic status. Participants under the age of 18 required informed parental consent and were instructed to supply parent/guardian contact information; the researchers were responsible for

contacting the parents/guardians to obtain consent before the child was given access to complete the survey. The second part of the survey contained 16 questions divided into 2 sections: attitude (8 questions) and practice (8 questions). Ethical approval was obtained from the Institutional Review Board (IRB) of the Faculty of Medicine, Syrian Private University. The survey is available in appendix 1.

Statistical analysis:

Frequencies and percentages (for categorical variables) or means and standard deviations (SD) (for continuous variables) were reported. The t-test was applied to compare attitude and practice questions against both genders. The chi-square test was applied to compare attitude and practice questions against socio-demographic variables (age, social status, residence, education level, occupation, economic status, and household members). Binary logistic regression analysis using the socio-demographic variables as independent variables was conducted against attitude (disagree with the travel ban and disagree with quarantine for travelers) and practice (avoiding crowded places and wearing face masks) questions as the outcome variable to identify factors associated with negative attitude, and good practice. Data analysis was conducted with Statistical Package for Social Sciences version 25.0 (SPSS Inc., Chicago, IL, United States). Statistical significance was considered at p-values < 0.05.

Results

Socio-demographics characteristics:

Of 4495 total participants who participated, participants who did not meet inclusion criteria were excluded, yielding a final sample of 3586 participants (completion rate = 79.8%), 2444(68.2%) of whom are female, and 1142(31.8%) of whom are male. Participants' ages ranged between 12 and 78 years with the mean being 30(± 10) years. Participants aged 16-30 years were the majority 2789(77.8%), while participants under 16 years were the minority 59(1.6%). The majority were single 2279(63.6%), unemployed 1822(50.8%), and had attained college/university level education 2839(79.2%). 1064(29.7%) participants were smokers, 428(11.9%) consumed alcohol, and 65(1.8%) knew a COVID-19 infected individual (Table 1). The majority of participants were residents of Damascus/Rural Damascus 2019(56.3%) (Figure1).

Practice (infection control) regarding COVID-19:

The majority of participants are avoiding public gatherings 2917(81.3%), abstaining from shaking hands and kissing 2755(76.8%), and washing hands for at least 30 seconds 2560(71.4%). Only 213(5.9%) are meeting with family members and friends; however, wearing a face mask, and maintaining a 1-meter interpersonal distance when leaving home were only demonstrated by 1402(39.1%), and 2285(63.7%) respectively (Table 2).

Attitudes regarding (COVID-19):

The majority of participants agreed to the following: infected individuals should be quarantined 3555(99.1%), closure of universities and schools 3436(95.8%), travels should be quarantined 3362(93.8%), travel ban between countries 3361(93.7%), and COVID-19 is a public health concern 3298(92.0). Only 2350(65.5%) participants agreed that infected individuals have the right to marriage, and shockingly 741(20.6%) agreed that lack of faith/religion is the cause of this pandemic (Table 3).

Practices towards COVID-19 by demographic values:

The practice towards avoiding crowded places and mass gatherings significantly differed across gender, age, social status, residence, education, occupation, and economic status ($p < 0.001$). The practice of wearing a face mask when leaving the house significantly differed across gender ($p < 0.001$), age group ($p = 0.004$), area ($p = 0.007$), occupation ($p < 0.001$), and the number of household members ($p = 0.008$) (Table 4).

Attitudes towards COVID-19 by demographic values:

The attitude of participants towards supporting travel ban between countries significantly differed across gender ($p = 0.009$), education ($p < 0.001$), economic status ($p = 0.015$), and the number of household members ($p = .014$). The attitude of participants towards quarantining travels significantly differed across gender ($p < 0.001$), age ($p = 0.038$), social status ($p = 0.015$), education ($p < 0.001$), and occupation ($p = 0.049$) (Table 5).

Multiple binary logistic regression analysis on factors significantly associated with good practice, and negative attitude:

Multiple logistic regression analysis showed that female gender (vs. male, OR:1.466, $p = 0.013$); age group of 16-30 years (OR 2.726, $p = 0.03$) and age group of 45 years and above (OR:10.855, $p = 0.008$) (vs. 31-45); residence in Hama (OR:4.306, $p = 0.024$), Aleppo (OR:4.680, $p = 0.032$), Homs (OR:6.214, $p = 0.011$), Tartous (OR 4.590, $p = 0.033$), Lattakia (OR:4.194, $p = 0.045$), and Dar'a (OR:6.695, $p = 0.01$) (vs. Damascus/Rural Damascus); economic status of moderate (OR:1.894, $p = 0.005$), good (OR:2.267, $p < 0.001$), and excellent (OR:2.070, $p = 0.026$) (vs. poor) were significantly associated with avoiding crowded places and mass gatherings (Table 6).

Female gender (vs. male, OR:1.455, $p<0.001$); age groups of <16 years, 31-45 years, and >45 years (vs. 16-30 years, OR:0.715, $p<0.001$); occupation of HCW (vs. government, private, business, military, unemployed, and other sectors, OR:1.394, $p<0.001$); residence in Damascus/Rural Damascus, Hama, Aleppo, Homs, Tartous, Lattakia, Dar'a, As-Sweida, Deir-ez-Zor, Ar- Raqqa, Quneitra (vs. Al-Hasakah, and Idlib, OR:1.581, $p<0.001$); living in urban areas (vs. rural OR:1.166, $p=0.034$); and using only personal toiletries (vs. not OR:0.613, $p<0.001$) were significantly associated with wearing a face mask when leaving the house (Table 6).

Female gender (vs. male, OR:2.034, $p<0.001$); age groups of <16 years, 31-45 years, >45 years (vs 16-30 years, OR:2.183, $p<0.001$); residence in Damascus/Rural Damascus, Hama, Aleppo, Homs, Tartous, Lattakia, Dar'a, As-Sweida, Deir-ez-Zor, Ar- Raqqa, and Quneitra (vs Al-Hasakah and Idlib, OR:3.666, $p<0.001$) were significantly associated with maintaining a 1-meter distance from people when outside (Table 6)

Multiple logistic regression analysis showed that age group of <16 years (OR: 0.012, $p=0.006$), 16-30 years (OR:0.006, $p=0.001$), 31-45 years (OR:0.003, $p<0.001$) (vs. >45); a career in business (vs HCW, OR: 4.379, $p=0.001$); residence in Damascus/Rural Damascus, Damascus, Aleppo, Homs, Tartous, Lattakia, Dar'a, As-Sweida, Deir-ez-Zor, Ar- Raqqa, and Quneitra (vs. Al-Hasakah and Idlib, OR:3.598, $p=0.009$); smoking (vs no, OR: 1.905, $p=0.006$) were significantly associated with disagreement regarding the closure of schools and universities (Table 6).

Age group of 16-30 years (OR:0.543, $p<0.001$), >45 years (OR:0.435, $p=0.015$) (vs. 31-45 years); one household member and above (vs. none OR:0.112, $p<0.001$); careers in government, private, business, military, unemployed, and other sectors (vs. HCW, OR:0.066, $p=0.001$); and alcohol consumption (vs. no, OR:0.624, $p=0.017$) were significantly associated with disagreement regarding the travel ban (Table 4).

Male gender (vs. female, OR 2.043, $p<0.001$); the age group of 16-30 years (vs. 31-45 years, OR:2.360, $p=0.027$); and careers in government, private, business, military, unemployed, and other sectors (vs. HCW, OR:0.005, $p<0.001$) were significantly associated with disagreement regarding quarantining travelers (Table 6).

Discussion

In the absence of an effective treatment or availability of vaccines against COVID-19 in Syria, the public's attitude and practice regarding preventive measures towards COVID-19 infection control are crucial to mitigating the spread of this virus. Therefore, it is important to assess the practice and attitude of the Syrian population, to provide baseline data for public health policymakers and health professionals to target specific populations, plan effective measures and awareness campaigns.

The majority of Syrian participants showed cautious practice towards the COVID-19 pandemic; (81.3%) avoided crowded places and public gatherings, (71.4%) washed hands for at least 30 seconds, and (76.8%) abstained from shaking hands and kissing. These findings observed in our study were lower compared with other studies conducted in India, China, and Malaysia,(10, 12, 13) but were higher than a study conducted in Sudan.(14) WHO and the centers for diseases control and prevention (CDC), recommended a set of public health interventions, physical distancing, staying at least two meters from people, avoiding mass gatherings in groups, and other protective measures to break the transmission cycle of COVID-19.(15, 16) Syrians knowledge regarding preventive measures have been shown to be high including avoiding crowded places (99.7%), and washing hands (99.7%), which shows a lack of adherence by our participants towards infection control.(9)

The present study showed low adherence to wearing face masks similar to a study conducted in Sudan and Egypt.(14, 17) In other studies conducted in China, Malaysia, Ecuador, and KSA, the number of people who wore face masks was much higher.(10, 13, 18, 19) In this novel pandemic where the economic status in Syria has deteriorated, significant price increases in personal sterilization items (face masks, hand sanitizers – up to 5,000% increase) have been reported across Syria.(20) The drastic increase in price and demand for masks due to shortage of supplies not just in Syria, but even worldwide can be the reason behind participants not wearing face masks.(21)

Data revealed that female participants were associated with good practice compared with male participants. A study conducted in China found an association with male gender and hazardous practice. This could be attributed to the fact that males are burdened with the responsibilities towards providing for their families, making them forced to find means of work to secure their livelihoods, which keeps them away from social media, awareness announcements on television and radio. Therefore, the government should target this group for education on preventive control measures to cut the spread of COVID-19.

On 12 March 2020, the Syrian government implemented precautionary measures to prevent the spread of the virus, concurrent with the declaration provided by WHO regarding the COVID-19 outbreak evolving into a worldwide pandemic.(22, 23) The vast majority (92%) of participants considered the COVID-19 pandemic to be a serious public health issue, much higher than in a Thailand study. Similarly, two other studies in China showed that the majority of people thought that the COVID-19 outbreak was very severe. The reason behind this attitude can be attributed to the high number of cases and mortality worldwide with the absence of treatment or vaccine at the time of the survey.(2)

Shockingly only 65.5% of participants agreed that infected individuals have the right to marry where the rest did not know and disagreed. This kind of stigma reflects negative beliefs and attitudes towards patients with COVID-19. 20.6% of the participants agreed that lack of faith/religion is the cause of this pandemic. A study conducted in Poland revealed that 64% of catholic women believed that faith will protect them from the COVID-19 and 67.6% declared that faith/spirituality was important for facing the COVID-19 pandemic. Approximately 90% of the population are Muslim, which can be the reason behind the stigma of negative views.(24)

Multiple logistic regression analysis showed that females; age group of ≥ 45 years; residence in Hama, Aleppo, Homs, Tartous, Lattakia, and Dar'a; were significantly associated with avoiding crowded places, wearing face masks, and maintaining a 1-meter interpersonal distance. The findings regarding the age group ≥ 45 years, can be attributed to the participants being more cautious as COVID-19 infection can be severe and lead to death in elderly, chronically ill, and

immunodeficient patients. 40.6% and 11,9% of Syrians are hypertensive and diabetic, respectively.(25, 26) This high prevalence of chronic diseases is alarming and underscores the need for targeted awareness campaigns towards younger generations through encouraging the use of face masks and avoiding meeting with older people to protect them from infection.

Multiple logistic regression analysis showed that the age group of 16-30 and occupation of government, private, business, military, unemployed, and other sectors were significantly associated with negative attitudes with regards to the travel ban and quarantining travelers. This age group lies in the productive population where a large fraction of the economy depends on this group, commuting to work and universities require transport to be open freely, and quarantine can have negative effects on people who rely on their daily work to earn a living.(20) Syrians that depend on daily work, such as taxi drivers and small store owners, cannot afford to quarantine, especially after the huge rise in food prices because of war and COVID-19 related factors like panic buying, and reduced store hours.(20) Non-healthcare occupations have not received the same education compared with HCW, educating the community about the impact of traveling and not quarantining travelers on the spread of COVID-19 infection is crucial. As this country has no capacity to withstand a pandemic, targeting these groups with awareness campaigns is cost-effective in the long run.

Limitations

Some limitations are found in this study, young, well-educated female participants were overrepresented in this study. Therefore, the results can only be generalized concerning these groups. The elderly and rural residents, who are vulnerable to COVID-19 making them at increased risk of getting the infection, are more likely to exhibit bad practices due to limited internet access. The study included participants from all Syrian governorates, but participants who live in Damascus/Rural Damascus were over-represented in our sample.

Conclusion

The world is facing a pandemic that threatens public health and humanity's existence. Our study revealed a lack of adherence to certain practices especially with regards to wearing face masks. Face masks should not be worn by choice, enforcing the mandatory wearing of face masks in public should be a fundamental law, and failure to do so is liable to pay a fine. Awareness should not only be restricted to social media platforms but also the Ministry of Public Health should come forth with new strategies to target groups associated with bad practices and negative attitudes.

Abbreviations

COVID-19: Coronavirus Disease 2019; WHO: World Health Organization; PHEIC: Public Health Emergency of International Concern; ICU: Intensive care unit; IRB: Institutional Review Board; SPSS: Statistical Package for Social Sciences; SD: Standard Deviation; HCW: Health Care Worker, CDC: Centers for Disease Control and Prevention.

Declarations

Ethics approval and consent to participate:

This study was approved by the Institutional Review Board (IRB) at the Syrian Private University (SPU); however, we were not given a reference number. Informed consent was obtained from all participants. Participants under the age of 18 required verbal informed parental consent, as well as submission of parent/guardian contact information. The researchers were responsible for contacting the parents/guardians to obtain verbal consent before the child was given access to the survey. The verbal and written form of consent was approved by the IRB at SPU. Participation in the study was voluntary and participants were assured that anyone who was not inclined to participate or decided to withdraw after giving consent would not be victimized. All information collected from this study was kept strictly confidential. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for Publication:

Not applicable.

Availability of data and materials:

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

Competing interests:

The authors declare that they have no competing interests.

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Authors' contributions:

BB and FM conceptualized the study, participated in the design, wrote the study protocol, did a literature search, and drafted the manuscript. MM performed the statistical analysis. HA and NA revised the draft. All authors read and approved the final draft.

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References

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395(10223):497-506.
2. Organization WH. WHO Coronavirus Disease (COVID-19) Dashboard: World Health Organization.
3. Organization WH. Getting your workplace ready for COVID-19: How COVID-19 spreads, 19 March 2020. World Health Organization; 2020.
4. Fischer I, Avrashi S, Oz T, Fadul R, Gutman K, Rubenstein D, et al. The behavioural challenge of the COVID-19 pandemic: indirect measurements and personalized attitude changing treatments (IMPACT). *Royal Society open science*. 2020;7(8):201131.
5. McNatt Z, Boothby NG, Al-Shannaq H, Chandler H, Freels P, Mahmoud AS, et al. Impact of Separation on Refugee Families: Syrian Refugees in Jordan. 2018.
6. McKernan B. Syria confirms first Covid-19 case amid fears of catastrophic spread. *The Guardian*, March. 2020;23.
7. Gharibah M, Mehchy Z. COVID-19 pandemic: Syria's response and healthcare capacity. 2020.
8. UNICEF Syria Crisis Situation Report - April 2019 Humanitarian Results: United Nations International Children's Emergency Fund; 2020.
9. Mohsen F, Bakkar B, Armashi H, Aldaher N. A Crisis within a Crisis: COVID-19 Knowledge and Awareness among the Syrian Population—A National Survey Assessment. 2020.
10. Zhong B-L, Luo W, Li H-M, Zhang Q-Q, Liu X-G, Li W-T, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *International journal of biological sciences*. 2020;16(10):1745.
11. Khader Y, Al Nsour M, Al-Batayneh OB, Saadeh R, Bashier H, Alfaqih M, et al. Dentists' awareness, perception, and attitude regarding COVID-19 and infection control: cross-sectional study among Jordanian dentists. *JMIR Public Health and Surveillance*. 2020;6(2):e18798.
12. Yousaf MA, Noreen M, Saleem T, Yousaf I. A Cross-Sectional Survey of Knowledge, Attitude, and Practices (KAP) Toward Pandemic COVID-19 Among the General Population of Jammu and Kashmir, India. *Social Work in Public Health*. 2020;35(7):569-78.
13. Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E. Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *Plos one*. 2020;15(5):e0233668.
14. Hezima A, Aljafari A, Aljafari A, Mohammad A, Adel I. Knowledge, attitudes, and practices of Sudanese residents towards COVID-19. *East Mediterr Health J*. 2020;26(6):646-51.
15. Organization WH. Coronavirus disease (COVID-19) advice for the public: World Health Organization; 2020.
16. Social distancing Centers for Disease Control and Prevention; 2020.
17. Abdelhafiz AS, Mohammed Z, Ibrahim ME, Ziady HH, Alorabi M, Ayyad M, et al. Knowledge, perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-19). *Journal of Community Health*. 2020:1-10.
18. Bates BR, Moncayo AL, Costales JA, Herrera-Cespedes CA, Grijalva MJ. Knowledge, attitudes, and practices towards COVID-19 among Ecuadorians during the outbreak: an online cross-sectional survey. *Journal of Community Health*. 2020;45(6):1158-67.
19. Alahdal H, Basingab F, Alotaibi R. An analytical study on the awareness, attitude and practice during the COVID-19 pandemic in Riyadh, Saudi Arabia. *J Infect Public Health*. 2020;13(10):1446-52.
20. Organization WH. SYRIAN ARAB REPUBLIC: COVID-19 Humanitarian Update No. 08: United Nations Office for the Coordination of Humanitarian Affairs World Health Organization; 2020.
21. Organization WH. Shortage of personal protective equipment endangering health workers worldwide: World Health Organization; 2020.
22. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Bio Medica: Atenei Parmensis*. 2020;91(1):157.
23. Organization WH. WHO Director-General's opening remarks at the media briefing on COVID-19. 2020. Website:/ Accessed. 2020;19.
24. Organization WH. SYRIAN ARAB REPUBLIC (THE) World Health Organization; 2004.
25. Tailakh A, Evangelista LS, Menten JC, Pike NA, Phillips LR, Morisky DE. Hypertension prevalence, awareness, and control in Arab countries: a systematic review. *Nurs Health Sci*. 2014;16(1):126-30.
26. Organization WH. WHO Diabetes Country Profiles 2016: World Health Organization; 2016.

Tables

Table 1
Sociodemographic characteristics of participants: (n=3586)

Gender(%)	Male	1142(31.8)	Education(%)	Primary School	25(0.7)
	Female	2444(68.2)		Intermediate School	166(4.6)
Age(%)	<16	59(1.6)	Secondary school	375(10.4)	
	16-30	2789(77.8)	College/University	2839(79.2)	
	31-45	503(14.0)	Master's degree	157(4.4)	
	>45	235(6.6)	PhD	24(0.7)	
Social Status(%)	Single	2279(63.5)	Occupation(%)	Health care worker	634(17.7)
	In a relationship	286(8.0)		Government institution	283(7.9)
	Married	943(26.3)		Private institution	182(5.1)
	Divorced	46(1.3)		Business	198(5.5)
	Widowed	32(0.9)		Military	32(0.9)
				Unemployed	1822(50.8)
Economic Status(%)	⁴ Excellent	331(9.2)	Other	435(12.1)	
	³ Good	1761(49.1)	Household members(%)	0	46(1.3)
	² Moderate	1247(34.8)		1-5	2751(76.7)
	¹ Poor	247(6.9)		>5	789(22)

¹Poor: income does not provide essential needs for the family.

²Moderate: income provides essential needs for the family but no more.

³Good: income provides essential needs and some luxury requirements.

⁴Excellent: income provides luxury requirements.

Table 2
Practice (infection control) regarding COVID-19: (n=3586)

	Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Do you avoid public gatherings (social and religious gatherings)?	2917(81.3)	465(13.0)	103(2.9)	101(2.8)
Do you still meet with family members and friends?	213(5.9)	873(24.4)	1178(32.8)	1322(36.9)
Do you wash your hands for at least 30 seconds?	2560(71.4)	846(23.6)	125(3.5)	55(1.5)
Do you wear a face facemask when leaving home?	1402(39.1)	806(22.5)	457(12.7)	921(25.7)
Do you maintain 1-meter between yourself and people when outside?	2285(63.7)	906(25.3)	236(6.6)	159(4.4)
Have you abstained from shaking hands and kissing?	2755(76.8)	534(14.9)	164(4.6)	133(3.7)
Do you use a tissue when sneezing or coughing?	3119(87.0)	343(9.6)	70(1.9)	54(1.5)

Table 3
Attitudes towards COVID-19 crisis: (n= 3586)

	Agree (%)	Disagree (%)	Do Not Know (%)
I believe COVID-19 pandemic is a serious public health issue.	3298(92.0)	170(4.7)	118(3.3)
I believe infected people should be self-isolated.	3555(99.1)	16(0.5)	15(0.4)
I aid the closure of universities, schools . . .	3436(95.8)	101(2.8)	49(1.4)
I aid the travel ban between countries.	3361(93.7)	202(5.6)	23(0.7)
I believe travelers should be quarantined.	3362(93.8)	172(4.8)	52(1.4)
I believe Infected patients have the right to marriage.	2350(65.5)	191(5.3)	1045(29.2)
I believe lack of faith/religion is the cause of this pandemic.	741(20.6)	2068(57.7)	777(21.7)
I believe that an infected individual deserves the infliction of disease.	89(2.4)	3075(85.8)	422(11.8)

Table 4
Practices of participants by sociodemographic characteristics, n(%) or mean (standard deviation)

Characteristics		P1-Avoid crowded places and mass gatherings (markets, parties, festivals, and mosques)				χ^2	P	P5-Wearing a face mask when leaving the house			
		Always	Rarely	Sometimes	Never			Never	Rarely	Sometimes	Always
Gender	Male	44(3.9)	38(3.3)	254(22.2)	806(70.6)	142.629	<0.001	335(29.3)	172(15.1)	283(24.8)	352(30.8)
	Female	57(2.3)	65(2.7)	211(8.6)	2111(86.4)			586(24.0)	285(11.7)	523(21.4)	1050(42.9)
Age group	<16	4(6.8)	4(6.8)	5(8.5)	46(78.0)	32.290	<0.001	17(28.8)	2(3.4)	15(25.4)	25(42.9)
	16-30	69(2.5)	72(2.6)	341(12.2)	2307(82.7)			751(26.9)	361(12.9)	596(21.4)	1081(38.8)
	31-45	23(4.6)	16(3.2)	72(14.3)	392(77.9)			114(22.7)	59(11.7)	129(25.6)	201(40.0)
	>45	5(2.1)	11(4.7)	47(20.0)	172(73.2)			39(16.6)	35(14.9)	66(28.1)	95(40.0)
Social status	Single	54(2.4)	56(2.5)	290(12.7)	1879(82.4)	36.304	<0.001	614(26.9)	291(12.8)	494(21.7)	880(38.4)
	Relationship	7(2.4)	4(1.4)	33(11.5)	242(84.6)			69(24.1)	45(15.7)	68(23.8)	104(36.5)
	Married	37(3.9)	37(3.9)	125(13.3)	744(78.9)			221(23.4)	113(12.0)	232(24.6)	377(40.0)
	Divorce	0(0.0)	4(8.7)	12(26.1)	30(65.2)			8(17.4)	5(10.9)	9(19.6)	24(52.3)
	Widow/Widower	3(9.4)	2(6.3)	5(15.6)	22(68.8)			9(28.1)	3(9.4)	3(9.4)	17(53.0)
Residence	Damascus/Rural Damascus	49(2.4)	59(2.9)	256(12.7)	1655(82.0)	76.845	<0.001	497(24.6)	238(11.8)	470(23.3)	814(40.3)
	Hama	7(3.1)	4(1.8)	27(12.1)	186(83.0)			67(29.9)	30(13.4)	51(22.8)	76(33.9)
	Aleppo	6(2.7)	3(1.3)	49(22.0)	165(74.0)			70(31.4)	29(13.0)	44(19.7)	80(35.9)
	Homs	7(3.2)	4(1.8)	23(10.5)	186(84.5)			55(25.0)	32(14.5)	49(22.3)	84(38.2)
	Tartous	3(1.4)	8(3.7)	20(9.3)	185(85.6)			45(20.8)	38(17.6)	47(21.8)	86(39.8)
	Latakia	3(1.5)	4(1.9)	28(13.6)	171(83.0)			59(28.6)	25(12.1)	46(22.3)	76(36.5)
	Dar'a	10(4.8)	11(5.3)	33(15.9)	153(73.9)			59(28.5)	26(12.6)	44(21.3)	78(37.7)
	As-Sweida	6(4.1)	3(2.0)	12(8.1)	127(85.8)			32(21.6)	20(13.5)	35(23.6)	61(41.9)
	Al-Hasakah	3(6.4)	2(4.3)	7(14.9)	35(74.5)			14(29.8)	8(17.0)	10(21.3)	15(31.5)
	Deir ez-Zor	3(11.1)	1(3.7)	2(7.4)	21(77.8)			2(7.4)	7(25.9)	4(14.8)	14(51.5)
	Idlib	3(15.0)	2(10.0)	5(25.0)	10(50.0)			12(60.0)	1(5.0)	1(5.0)	6(30.0)
	Ar-Raqqah	1(4.8)	1(4.8)	3(14.3)	16(76.2)			7(33.3)	3(14.3)	3(14.3)	8(38.1)
	Quneitra	0(0.0)	1(12.5)	0(0.0)	7(87.5)			2(25.0)	0(0.0)	2(25.0)	4(50.0)
Areas	Urban	68(2.8)	69(2.8)	317(13.1)	1972(81.3)	0.086	0.993	585(24.1)	310(12.8)	574(23.7)	957(38.4)
	Rural	33(2.8)	34(2.9)	148(12.8)	945(81.5)			336(29.0)	147(12.7)	232(20.0)	445(38.3)
Education	Primary school	3(12.0)	2(8.0)	3(12.0)	17(68.0)	68.373	<0.001	10(40.0)	4(16.0)	4(16.0)	7(28.0)
	Secondary school	19(5.1)	20(5.3)	56(14.9)	280(74.7)			99(26.4)	48(12.8)	73(19.5)	155(41.3)
	High school	13(7.8)	7(4.2)	16(9.6)	130(78.3)			43(25.9)	10(6.0)	32(19.3)	81(48.8)
	University/College	63(2.2)	69(2.4)	350(12.3)	2357(83.0)			725(25.5)	372(13.1)	649(22.9)	1093(37.3)
	Master's degree	2(1.3)	4(2.5)	36(22.9)	115(73.2)			40(25.5)	20(12.7)	41(26.1)	56(35.8)
	PHD	1(4.2)	1(4.2)	4(16.7)	18(75.0)			4(16.7)	3(12.5)	7(29.2)	10(41.7)
Occupation	Health care worker	9(1.4)	14(2.2)	91(14.4)	520(82.0)	78.874	<0.001	130(20.5)	81(12.8)	174(27.4)	249(38.3)
	Government institution	10(3.5)	10(3.5)	37(13.1)	226(79.9)			67(23.7)	44(15.5)	51(18.0)	121(42.8)
	Private institution	5(2.7)	8(4.4)	34(18.7)	135(74.2)			42(23.1)	17(9.3)	61(33.5)	62(34.2)
	Business	7(3.5)	9(4.5)	47(23.7)	135(68.2)			54(27.3)	37(18.7)	41(20.7)	66(33.3)
	Military	4(12.5)	2(6.3)	10(31.3)	16(50.0)			12(37.5)	4(12.5)	8(25.0)	8(25.0)
	Unemployed	48(2.6)	48(2.6)	187(10.3)	1539(84.5)			504(27.7)	218(12.0)	384(21.1)	716(39.9)

	Other	18(4.1)	12(2.8)	59(13.6)	346(79.5)			112(25.7)	56(12.9)	87(20.0)	180(4)
Economical status	Excellent	8(2.4)	8(2.4)	33(10.0)	282(85.2)	37.094	<0.001	72(21.8)	37(11.2)	71(21.5)	151(4)
	Good	42(2.4)	38(2.2)	224(12.7)	1457(82.7)			473(26.9)	220(12.5)	395(22.4)	673(3)
	Moderate	34(2.7)	42(3.4)	170(13.6)	1001(80.3)			312(25.0)	168(13.5)	292(23.4)	475(3)
	Poor	17(6.9)	15(6.1)	38(15.4)	177(71.7)			64(25.9)	32(13.0)	48(19.4)	103(4)
Household members	0	2(4.3)	0(0.0)	4(8.7)	40(87.0)	3.052	0.802	13(28.3)	8(17.4)	12(26.1)	13(28)
	1-5	75(2.7)	79(2.9)	355(12.9)	2242(81.5)			675(24.5)	361(13.1)	647(23.5)	1068(
	>5	24(3.0)	24(3.0)	106(13.4)	635(80.5)			233(29.5)	88(11.2)	147(18.6)	321(4)

Table 5
Attitudes of participants by sociodemographic characteristics, n(%) or mean (standard deviation)

Characteristics		A4-I support the travel ban between countries					A5-I believe travelers should be quarantined.				
		Disagree	Agree	IDK	χ^2	P	Disagree	Agree	IDK	χ^2	P
Gender	Male	75(6.6)	1054(92.3)	13(1.1)	9.416	0.009	84(7.4)	1038(90.9)	20(1.8)	25.389	<0.001
	Female	127(5.2)	2307(94.4)	10(0.4)			88(3.6)	2324(95.1)	32(1.3)		
Age group	<16	4(6.8)	53(89.8)	2(3.4)	9.520	0.146	5(8.5)	52(88.1)	2(3.4)	13.350	0.038
	16-30	153(5.5)	2618(93.9)	18(0.6)			146(5.2)	2603(93.3)	40(1.4)		
	31-45	34(6.8)	467(92.8)	2(0.4)			10(2.0)	486(96.6)	7(1.4)		
	>45	11(4.7)	223(94.9)	1(0.4)			11(4.7)	221(94.0)	3(1.3)		
Social status	Single	123(5.4)	2144(94.1)	12(0.5)	6.990	0.538	128(5.6)	2120(93.0)	31(1.4)	18.998	0.015
	Relationship	19(6.6)	264(92.3)	3(1.0)			14(4.9)	270(94.4)	2(0.7)		
	Married	57(6.0)	879(93.2)	7(0.7)			27(2.9)	899(95.3)	17(1.8)		
	Divorce	1(2.2)	45(97.8)	0(0.0)			2(4.3)	44(95.7)	0(0.0)		
	Widow/Widower	2(6.3)	29(90.6)	1(3.1)			1(3.1)	29(90.6)	2(6.3)		
Residence	Damascus/Rural Damascus	113(5.6)	1895(93.9)	11(0.5)	27.550	0.279	103(5.1)	1889(93.6)	27(1.3)	25.451	0.382
	Hama	13(5.8)	211(94.2)	0(0.0)			11(4.9)	210(93.8)	3(1.3)		
	Aleppo	12(5.4)	208(93.3)	3(1.3)			8(3.6)	209(93.7)	6(2.7)		
	Homs	13(5.9)	205(93.2)	2(0.9)			16(7.3)	202(91.8)	2(0.9)		
	Tartous	7(3.2)	208(96.3)	1(0.5)			9(4.2)	205(94.9)	2(0.9)		
	Lattakia	18(8.7)	185(89.8)	3(1.5)			7(3.4)	196(95.1)	3(1.5)		
	Dar'a	7(3.4)	198(95.7)	2(1.0)			5(2.4)	198(95.7)	4(1.9)		
	As-Sweida	8(5.4)	139(93.9)	1(0.7)			7(4.7)	136(91.9)	5(3.4)		
	Al-Hasakah	7(14.9)	40(85.1)	0(0.0)			2(4.3)	45(95.7)	0(0.0)		
	Deir ez-Zor	3(11.1)	24(88.9)	0(0.0)			4(14.8)	23(85.2)	0(0.0)		
	Idlib	0(0.0)	20(100.0)	0(0.0)			0(0.0)	20(100.0)	0(0.0)		
	Ar-Raqqah	0(0.0)	21(100.0)	0(0.0)			0(0.0)	21(100.0)	0(0.0)		
	Quneitra	1(12.5)	7(87.5)	0(0.0)			0(0.0)	8(100.0)	0(0.0)		
Areas	Urban	132(5.4)	2277(93.9)	17(0.7)	0.917	0.632	125(5.2)	2265(93.4)	36(1.5)	2.163	0.339
	Rural	70(6.0)	1084(93.4)	6(0.5)			47(4.1)	1097(94.6)	16(1.4)		
Education	Primary school	3(12.0)	21(84.0)	1(4.0)	32.948	<0.001	3(12.0)	21(84.0)	1(4.0)	35.994	<0.001
	Intermediate school	18(4.8)	354(94.4)	3(0.8)			16(4.3)	358(95.5)	1(0.3)		
	Secondary school	11(6.6)	150(90.4)	5(3.0)			10(6.0)	146(88.0)	10(6.0)		
	University/College	158(5.6)	2670(94.0)	11(0.4)			136(4.8)	2666(93.9)	37(1.3)		
	Master's degree	9(5.7)	146(93.0)	2(1.3)			7(4.5)	148(94.3)	2(1.3)		
	PHD	3(12.5)	20(83.3)	1(4.2)			0(0.0)	23(95.8)	1(4.2)		
Occupation	Health care worker	34(5.4)	593(93.5)	7(1.1)	18.378	0.105	40(6.3)	591(93.2)	3(0.5)	21.065	0.049
	Government institution	19(6.7)	263(92.9)	1(0.4)			11(3.9)	271(95.8)	1(0.4)		
	Private institution	10(5.5)	172(94.5)	0(0.0)			6(3.3)	171(94.0)	5(2.7)		
	Business	19(9.6)	178(89.9)	1(0.5)			14(7.1)	180(90.9)	4(2.0)		
	Military	2(6.3)	29(90.6)	1(3.1)			1(3.1)	30(93.8)	1(3.1)		
	Unemployed	1035.7)	1710(93.9)	9(0.5)			86(4.7)	1703(93.5)	33(1.8)		
	Other	15(3.4)	416(95.6)	4(0.9)			14(3.2)	416(95.6)	5(1.1)		

Economical status	Excellent	21(8.5)	222(89.9)	4(1.6)	15.853	0.015	15(4.5)	311(94.0)	5(1.5)	9.116	0.167
	Good	64(5.1)	1177(94.4)	6(0.5)			87(4.9)	1656(94.0)	18(1.0)		
	Moderate	93(5.3)	1660(94.3)	8(0.5)			56(4.5)	1170(93.8)	21(1.7)		
	Poor	24(7.3)	302(91.2)	5(1.5)			14(5.7)	225(91.1)	8(3.2)		
Household members	0	2(4.3)	44(95.7)	0(0.0)	12.566	0.014	2(4.3)	43(93.5)	1(2.2)	5.759	0.218
	1-5	155(5.6)	2585(94.0)	11(0.4)			125(4.5)	2592(94.2)	34(1.2)		
	>5	45(5.7)	732(92.8)	12(1.5)			45(5.7)	727(92.1)	17(2.2)		

Table 6

Multiple binary logistic regression analysis on factors significantly associated with practices, and attitudes towards COVID-19

	p.value	OR	95% C.I.for OR	
			Lower	Lower
Practice				
<i>Avoid crowded places and mass gatherings (markets, parties, festivals, and mosques) (vs not)</i>				
Female gender (vs Male)	0.013	1.466	1.085	1.981
Age group 16-30 years (vs 31-45)	0.030	2.726	1.099	6.759
Age group >45 (vs 31-45)	0.008	10.855	1.838	64.086
Residence in Hama (vs Damascus/Rural Damascus)	0.024	4.306	1.207	15.370
Residence in Aleppo (vs Damascus/Rural Damascus)	0.032	4.680	1.143	19.159
Residence in Homs (vs Damascus/Rural Damascus)	0.011	6.214	1.517	25.459
Residence in Tartous (vs Damascus/Rural Damascus)	0.033	4.590	1.128	18.678
Residence in Lattakia (vs Damascus/Rural Damascus)	0.045	4.194	1.030	17.074
Residence in Dar'a (vs Damascus/Rural Damascus)	0.010	6.695	1.577	28.415
Moderate economic status (vs poor)	0.005	1.894	1.216	2.950
Good Economic status (vs poor)	<0.001	2.267	1.448	3.549
Excellent economic status (vs poor)	0.026	2.070	1.090	3.932
<i>Wearing a face mask when leaving the house (vs not)</i>				
Female gender (vs Male)	<0.001	1.455	1.260	1.680
Age group years <16, 31-45, and >45 years (vs 16-30)	<0.001	0.715	0.608	0.841
Occupation in Health Care sector (vs Government, private, Business, Military, Unemployed, and Other)	<0.001	1.394	1.159	1.676
Residence in Damascus/Rural Damascus, Hama, Aleppo, Homs, Tartous, Lattakia, Dar'a, As-Sweida, Deir-ez-Zor, Ar- Raqqah, and Quneitra (vs Al-Hasakah, and Idlib)	<0.001	1.581	1.302	1.920
Urban areas (vs Rural)	0.034	1.166	1.011	1.345
Using only personal toiletries (vs no)	<0.001	0.613	0.525	0.715
<i>Leaving over a meter between yourself and people when leaving the house</i>				
Female gender (vs Male)	<0.001	2.034	1.649	2.508
Age group <16, 31-45, and >45 years (vs 16-30)	<0.001	2.183	1.607	2.964
Primary, secondary, and high school education (vs college/university, master, and PhD)	<0.001	1.728	1.337	2.233
Residence in Damascus/Rural Damascus, Hama, Aleppo, Homs, Tartous, Lattakia, Dar'a, As-Sweida, Deir-ez-Zor, Ar- Raqqah, and Quneitra (vs Al-Hasakah, and Idlib)	<0.001	3.666	2.767	4.857
Attitude				
<i>disagree with closure of universities, schools (vs. agree)</i>				
Age group <16 years (vs >45)	0.006	0.012	0.000	0.272
Age group 16-30 years (vs >45)	0.001	0.006	0.000	0.122
Age group 31-45 years (vs >45)	<0.001	0.003	0.000	0.068
Occupation in Business (vs HCW)	0.001	4.379	1.904	10.074
Residence in Damascus/Rural Damascus, Hama, Aleppo, Homs, Tartous, Lattakia, Dar'a, As-Sweida, Deir-ez-Zor, Ar- Raqqah, and Quneitra (vs Al-Hasakah, and Idlib)	0.009*	3.598	1.383	9.358
Smoking (vs no)	0.006*	1.905	1.204	3.014
<i>Disagree with travel ban (vs. agree)</i>				
Age group 16-30 years (vs 31-45)	<0.001	0.543	0.388	0.759
Age group >45 years (vs 31-45)	0.015	.435	0.223	0.848
>5, and 1-5 household members (vs 0)	<0.001	0.112	0.082	0.154
Occupation in government, private, business, military, unemployed, and other sectors (vs. HCW)	0.001	0.066	0.014	0.316

Alcohol consumption (vs no)	0.017	0.624	0.424	0.919
<i>Disagree with quarantine for travelers (vs. agree)</i>				
Male gender (vs Female)	<0.001	2.043	1.480	2.821
Age group 16-30 years (vs 31-45)	0.027	2.360	1.101	5.057
Occupation in government, private, business, military, unemployed, and other sectors (vs. HCW)	<0.001	0.005	0.001	0.042

Figures

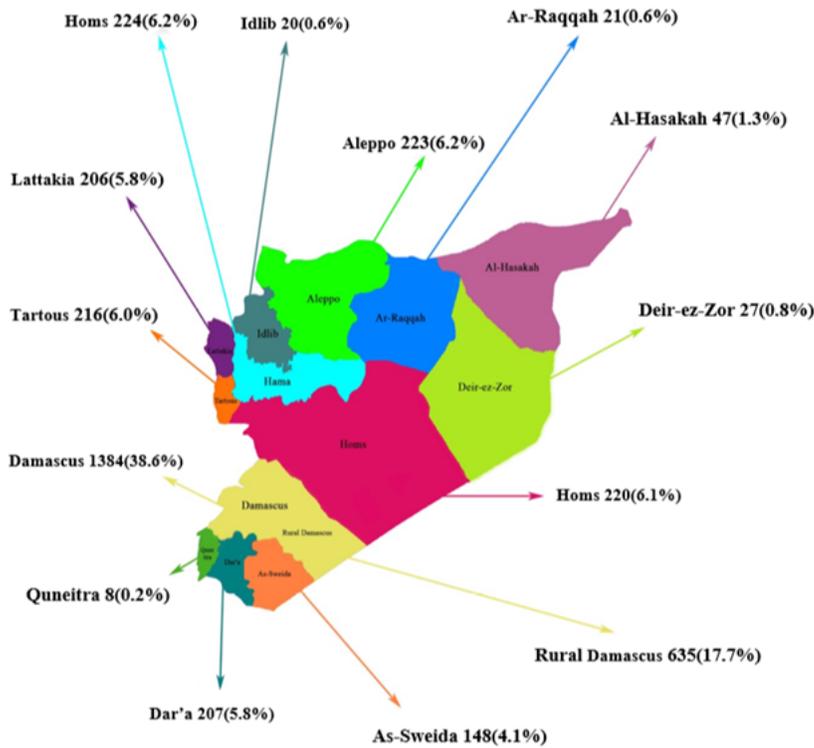


Figure 1

Distribution of participants according to governorates

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