

A Study on the Compliance, Risk Perception and Attitude of University of Khartoum Medical Students to Safety Measures against COVID-19 during the Period of Lockdown, a Cross-Sectional Study

Mustafa Mohamed Ibrahim Ali

University of Khartoum

Khabab Abbasher Hussien Mohamed Ahmed (✉ Khabab9722@gmail.com)

University of Khartoum

Mohammed Eltahier Abdalla Omer

Gadarif University

Gaffar Alemam A. Manhal

University of Khartoum

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Abstract

Background

COVID-19 is a novel respiratory infectious disease. Preventive measures against COVID-19 include facemask use, physical distancing and good sanitation and hygiene practices. Risk perception of COVID-19 is important in prevention. Lockdown was imposed in Sudan in early 2020.

The study aim to:

study the compliance, risk perception and attitude of University of Khartoum Medical Students to safety measures during the period of COVID-19 lockdown.

Methodology:

A University-based cross sectional study was conducted at the University of Khartoum, Faculty of Medicine in 435 students selected via proportionate stratified random sampling through a self-administered semi-structured questionnaire. Data was analyzed using SPSS version 20. Pearson and Mann Whitney U test were used to measure associations.

Result

Out of 435 participants, a mean adherence of 57.7%, mean risk perception of 73.6% was elicited. And 80.3% had a positive attitude towards lockdown. Adherence had significant association with gender and risk perception. Risk perception had no significant relation with gender.

Conclusion

In conclusion, adherence to preventive measures among medical students of the University of Khartoum was poor. Risk Perception was high. Attitude towards lockdown was positive.

Background

Coronavirus disease 2019(1)(COVID-19) also known as 2019-nCoV(2)[a novel severe acute respiratory syndrome (SARS) (1) was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. The novel virus first appeared in Wuhan City, in the Hubei Province of China at the end of December, 2019 (2–5). The virus continued to spread around globally with people from many countries suffering the death of loved ones and difficult financial situations (5). Transmission of the virus is mainly

through respiratory droplets or via contact with infected secretions. Spread via contaminated surfaces is also probable (4).

Symptoms include fever, fatigue, cough, and difficulty breathing and ranged from mild to severe, even leading to respiratory failure and death. At the end of January 2020, it was confirmed that this infection can be spread from person to person, especially through close contact with an infected person within 14 days of the onset of symptoms. In addition, it has been established that infection can transfer from a person carrying the virus without demonstrating signs or symptoms of infection (asymptomatic) (5).

Preventive measures, which include observing proper hand hygiene (5), through increased hand washing and use of sanitizing hand gels, covering coughs (6), maintaining social distancing, avoiding crowded places (5), wearing masks (6,7) and observing quarantine protocols. Furthermore, closing public places such as schools, restaurants, barbershops, and workplaces whilst letting people work remotely from home have also been introduced to reduce the spread of the virus(5). Governments around the world are working hard to contain the spread of COVID19. A major component of these efforts applied by public health authorities is self-quarantine (1,10). In non-profit organizations, quarantine interventions have proven to be very effective in reducing the spread of COVID19 (8). The primary purpose of quarantine is to prevent transmission of an infectious agent from those potentially incubating it (9).

To limit the spread of COVID-19 infection, the strategy being adopted is to encourage people to follow preventive measures, which include observing proper hand hygiene, maintaining social distancing, avoiding crowded places, and observing quarantine protocols. Therefore it is important to assess the compliance rate of the population to these measures to make sure of the efficiency of these measures and try to identify the obstacles and difficulties associated with following these measures and address these problems in order to relieve or solve them.

Objectives:-

General Objective:

To study the Compliance, risk perception and attitude of University of Khartoum Medical Students to Safety measures During the Period of COVID-19 lockdown.

Specific Objectives:

1. To determine the practices of the following among medical students in University of Khartoum during the period of COVID-19 lockdown.
 - a. Facemask use.
 - b. Social Distancing.
 - c. Sanitation and hygiene.
2. To identify factors associated with difficulty of compliance with safety measures faced by University of Khartoum medical students during the period of COVID-19 lockdown.
3. To demonstrate risk perception of University of Khartoum medical students towards COVID-19.
4. To determine the attitude of University of Khartoum medical students towards lockdown measures.

Materials And Methods

Study design:

This was a university-based cross-sectional study.

Study Area:

The University of Khartoum, Initially called Gordon's Memorial College, the university was founded in 1902 by the British colonizer. The faculty of medicine was founded by Lord Kitchener in 1924 and then both institutes were joined together under the name "The University of Khartoum" which was the first university in Sudan and one of the first universities in Africa. It is home to the top students in Sudan and some of the most brilliant minds to have ever passed the country. The faculty of medicine of the university lies in AlQasr Ave. in Khartoum City in Khartoum State in Sudan.

Study Population:

Medical students registered at the University of Khartoum. From first year to sixth year. Seven batches in total as there are currently seven batches registered at the faculty of medicine. Total number of students is 2341.

Inclusion Criteria:

1. Undergraduate student registered at the faculty of medicine, University of Khartoum.

Exclusion Criteria:

1. Students who refuse to participate.
2. Students who were outside Sudan during lockdown.

Sampling

Sample Size:

By using the equation: $n = N/(1+Nd^2)$ n = Sample size.

N = Size of the population = 2341

d= tolerated margin of error, 5% (0.05) for a 95% confidence interval.

$n = 2341/(1+ 2341 \times .05 \times .05) = 2341/(1+5.8525) = 2341/6.8525 = 341$ samples.

Number of samples from each batch = (Number of students in the batch/Total

number of medical students) x 341

Sampling Technique:

Proportionate stratified random sampling technique was used.

Data Collection:-

Web based, well-validated semi-structured questionnaires were distributed to samples by means of Google Form.

Data Analysis:-

Google spreadsheet was downloaded, converted into excel sheet and inserted into SPSS, then it was coded. Analysis was done using SPSS version 20. Data is presented as frequencies and percentages using figures and tables. Pearson correlation test was used to test correlation between overall adherence and risk perception.

Spearman test was used to test correlation between each type of adherence.

A (P value less than 0.05) is considered significant.

Ethical Consideration:

This research was conducted after obtaining ethical approval from the Community Medicine department at the Faculty of Medicine at the University of Khartoum.

Consent:

Written consent was obtained from all participants.

Results

Demographic characteristics and source of knowledge about safety measures:

In this study, 435 participants were enrolled. The majority of them were female (60%). The majority was also single (99.8%). The majority resided with family during lockdown (85%). Most were inside Khartoum (84%). Monthly income of most participants is "15000 SDG or above" (45%). The mean age was 21 (SD=2.1). The most common source of knowledge about safety measures against COVID-19 was "social media" followed by "TV" then "family members and friends". (See Table 1)

Facemask use Practice:

Out of all participants, 2% believed that facemasks are not effective in preventing the transmission of the covid-19 virus and 10% did not use facemasks during lockdown. Type of mask used most was disposable masks (58%) followed by fabric masks (32%) .Out of all participants, 11% lowered their mask to eat, drink or smoke in public, 47% lowered it when talking to close friends or relatives. Around 46% did not wear facemasks when visiting relatives or friends. A majority of 61% did not wear facemasks in the car, 13% did not wear it at the supermarket and 7% did not wear it at hospitals and clinics.

The main obstacle to using facemasks was that facemasks caused the feeling of being suffocated (reported by 213 participants) (about 49%). The second most common obstacle faced was that facemasks cause skin problems (156 responses) (around 36%).

There is no significant relation between adherence to social/ physical distancing practices and belief in their role in prevention of transmission of COVID-19.

Risk Perception:

Almost 66.7% of participants gave a maximum score of "5" when asked how worried they were about their loved ones becoming infected with COVID-19, making it the commonest answer recorded. While 32.4% of participants gave a score of "5" regarding how prevalent they thought coronavirus disease was in Sudan, 31.3% gave a score of "4", making these two scores the most common answers recorded. Around 41.2% of participants answered with a score of "3" regarding how deadly they thought coronavirus disease was. Around 34.5% of participants answered with a score of "5" on how probable they thought it was for them to become infected with COVID-19 if they did not apply preventive measures, marking the commonest recorded response.

The commonest response given to how worried the participants were about becoming infected with COVID-19 was the answer "3" on the Likert scale given by 28.5% of participants.

Attitude towards lockdown:

A majority of participants (68.3%) stated they complied with lockdown measures because they were afraid their loved ones would become infected with COVID-19 making it the commonest option checked on the checklist. Around 7.6% of participants stated they complied because other people were complying. Around 7% of participants stated that they did not comply with lockdown measures.

Discussion

To our knowledge this is the first paper on the topic of risk perception, adherence to covid-19 preventive measures and attitude towards lockdown in medical students of Sudan. The main source of knowledge about COVID-19 preventive measures was found to be social media followed by TV then family and friends. This is consistent with a theory made by another study which stated that although it did not investigate the source of knowledge it is likely that it was mass media (3). This may be due to the frequent use of mobile devices by people in this age group as well as watching more television as people had to spend more time at home.

In this study, the overall response rate was 127%. The average overall adherence to preventive measures score was 15 (SD=3.7) out of 26 (about 57.69%) which is markedly less than results of a similar study in Iran which evaluated adherence of medical students that found the average adherence level to be 94.47% (14). This contradiction may be due to differences in socio-economic situations between participants in this study and participants in the study conducted in Iran. Overall mean adherence to preventive measures among females (15.3) was found to be higher than that among males (14.4). Mann Whitney U test was significant with a (p value of 0.06). This is similar to a study conducted in Egypt by Enayat M. Soltan et Al. which found that females have higher percentages in regard to practicing preventive behaviors ($P < 0.001$) (11). This could be due to the fact that females are more observant of cleanliness and how society views them and this reflects on the cultural background of the Sudanese community. Regarding adherence to facemask use, 90% of participants used facemasks during lockdown. This is significantly higher than the 50% figure reported by a similar study conducted on the Somali community by Mohammed A. M. Ahmed et Al (12). However, only 6.4% used them correctly. This could be related to the high degree of risk perception towards COVID-19 recorded from participants as the majority was worried about their loved ones becoming infected, and to a lesser degree themselves becoming infected. Questions about social distancing were in the form of Likert-scale statements, 31% of participants said they never attended social gatherings which is a significantly lower percentage than a study conducted in Saudi Arabia by Nouf Alotaibi et Al, which showed that around 75% of participants would never attend social gathering (5). This could be due to scarcity of entertainment and activities during lockdown as well as the cultural background of the Sudanese community. 31% of participants stated they never kept safe

distance from others which is significantly higher than the Saudi study which reported 4% would never keep safe distance. This could be due to the high level of boredom recorded from participants.

Regarding sanitation and hygiene practices 98% of participants believed it had a role in preventing virus transmission similar to a study conducted by Enayat M. Soltan et Al. which found that 92.2% know the importance of handwashing and hygiene (13). This could be directly related to knowledge of medical students regarding communicable diseases. The majority of participants (52%) washed their hands for 10-20 seconds which is less time than that recommended by the WHO and the CDC in their guidelines (15). There was a significant relation between facemask use adherence and belief of facemask effectiveness in prevention of COVID-19 transmission. There was a significant relation between keeping good sanitation and hygiene practices and belief of their role in prevention of the transmission of the virus. This could very well be related to the knowledge of medical students about communicable diseases and infectious agents.

The main obstacle for facemask use was found to be that facemasks cause the feeling of suffocation reported by 213 participants (48%) followed by skin problem causation, communication hindrance and fogging of glasses, 156, 137, 133 responses respectively in close proximity to each other. This could be due to the fact that medical students had to wear facemasks for extended periods of time. The major obstacles to social (physical) distancing were found to be boredom as 206 participants checked it on the checklist (47.3%) and non-application of safety measures by other people at 201 responses (46.2%). Anxiety was third in line at 133 recorded responses (30%).

The major obstacles to keeping good sanitation and hygiene practices was that respondents found it tiring to keep washing their hands at most times recorded by 194 respondents (44.6%). 155 participants (35.6%) recorded that hand sanitizers were unavailable for purchase during lockdown. 139 participants (32%) recorded that prices of hand sanitizers were expensive.

The majority of participants showed great worry about their loved ones becoming infected as 290 participants (66.7%) answered with the maximum response grade of "5". On the question regarding probability of becoming infected if one didn't follow preventive measures the commonest answer was also the maximum response grade of "5" with 150 responses recorded. From these results, respondents were more worried about their loved ones becoming infected than themselves, similar to the study conducted in Brazil by Edlaine Faria de Moura Villela et Al (13). This could be related to the nature of human beings as well as the cultural and religious background of the Sudanese community.

84% of participants answered with a grade of 3 or above to how deadly they perceive COVID-19. Hence, the majority of participants recognized COVID-19 as a life threatening disease which is similar to what Enayat M. Soltan et Al. found in her study as 83% of participants in their study thought COVID-19 is a life-threatening illness (13). This could be due to knowledge about COVID-19 but could also be related to rumors in society. Pearson correlation found that there is a significant positive medium strength correlation between level of adherence and risk perception ($p < 0.001$ $r=0.32$) which is in contrast with a study conducted in Iranian medical students by Mohammad Hossein Taghrir et Al. which found a

negative significant correlation between self-reported preventive behaviors and risk perception (14). However, this result is similar to that found by M. Guillon et Al in their study(8). This could be due to the level of strictness of authorities in imposing lockdown.

There was no significant relation between risk perception and gender (p value=0.8) and the median risk perception of females was found to be 20 while that of males was found to be 18 slightly higher in females. This is in contrast to a study in Iran which reported that there was a significant difference between males and females in risk perception, with risk perception being lower among females (14). This could be related to the difference in cultural backgrounds between Sudan and Iran.

The attitude of participants in this study towards lockdown was assessed based on three items. 80.3% of participants agreed with the imposition of lockdown as a preventive measure while 19.7% disagreed. 58.5% thought benefits from lockdown outweighed its disadvantages showing that over half of the sample had a positive attitude towards lockdown. This could be related to background views on public health importance. However, the marked difference between the 80.3% and 58.5% figures could be due to socio-economic situations. This is similar to the results of a study conducted in France by Patrick Peretti-Watel et Al. which found that most participants supported lockdown as the only effective way to fight the epidemic and the need to maintain it for several more weeks; however, this support was significantly lower among low income respondents (16).

Conclusion

In conclusion, adherence to preventive measures practice among medical students of the University of Khartoum during lockdown was poor. Risk Perception of COVID-19 was high. Attitude towards lockdown was positive in over half of participants. Major obstacles to compliance were determined and were found to be sensation of suffocation by facemasks, boredom for social/physical distancing and being weary of washing hands with water and soap frequently.

Declarations

Consent for publication

Not applicable.

Availability of data and materials

The materials datasets used and/or analyzed during this 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

MMI and KAH collected data and did analysis. MEA and GAA wrote first draft. All authors participated to a significant extent in planning the study, data collection, analysis and writing final draft.

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Tables

Table 1: Demographic characteristics

Demographic characteristics		Frequencies (%)	
gender	Female	261(60%)	
	Male	174(40%)	
Marital status	Married	1(0.2%)	
	Single	434(99.8)	
Residence site	Inside Khartoum	366(84%)	
	Outside Khartoum	69(16%)	
Residence with	Alone	2(0.5%)	
	Friend	1(0.2%)	
	In dorms	41(9.4%)	
	Outside Sudan	1(0.2%)	
	With family	370(85.1%)	
	With Relatives	20(4.6%)	
	Monthly income	less than 5000 SDG	72(16.6%)
	5000-10,000 SDG	101(23.2%)	
	10,000-15,000 SDG	68(15.6%)	
	15,000 SDG and more	194(44.6%)	
grade	6 th grade	49(11.3%)	
	5 th grade	62(14.3%)	
		4 th grade	55(12.6%)
		3 rd grade	68(15.6%)
		2 nd grade	65(14.9%)
		1 st grade semester two	60(13.8%)
		1 st grade semester one	76(17.5%)
			Total= 435

Supplementary Files

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