

Knowledge, attitude and practice of the Sudanese people towards COVID-19: An online survey

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Abstract

Background: The Novel Corona Virus (SARS-CoV-2) had emerged to affect the human population in 2019 causing COVID-19 pandemic. The disease has no vaccine and no definitive treatment; the only preventive measures available are social distancing, hand washing and masks. This study aims to assess the knowledge, attitude and practice of the Sudanese people towards COVID-19.

Methods: A cross-sectional study targeting adult Sudanese people was conducted out in Sudan in April 2020. The study used an online self-administered questionnaire and utilized social media such as Facebook and WhatsApp. The total number of eligible questionnaires was 987.

Results: The mean (SD) age of respondents was 30.13 (9.84) years with males representing 55.4%. The majority were university and higher educated (95.2%) and residing in Khartoum (71.7%). The knowledge of the participants was rated as good in 90.6% and was found to be associated with education level (p -value = 0.001). The attitude was found good in 81.8% and was associated with females gender (p =0.02). The practice related to COVID-19 preventive measures was found good in 89.8% of the participants and was associated with sex and area of residence (p = 0.003, and p = 0.001 respectively).

Conclusions: This study showed that there was good knowledge, attitude and practices among the participants who are mostly young and educated. Females tend to be superior in their attitudes and practices.

Introduction

The Novel Corona Virus (SARS-CoV-2) belongs to a family of RNA viruses that causes different symptoms such as cough, fever, headache, myalgia, dyspnea and diarrhoea. These viruses are common in the animal's world, but very few cases have been known to affect humans (1). The emergence of Severe Acute Respiratory Syndrome (SARS- CoV1) in China, 2003-2004 and Middle East Respiratory Syndrome (MERS-CoV) in Saudi Arabia, 2012 marked the introduction of a highly pathogenic coronavirus into human population (1).

On December 31, 2019, the outbreak of novel coronavirus disease (COVID-19) was first reported in Wuhan, China. The virus spread rapidly within few weeks throughout China and within one month to several other countries including far west until declared as a pandemic by the World Health Organization in March 2020 (2,3). The virus was first linked to contact with the seafood market in Wuhan. However, immediately human-to-human transmission via close contact was reported and there was an increase of community transmission (1). The prevalence and emergence of a virus generally depend on infectivity and virulence of the virus itself; in addition to the interaction of the social environment, economic activities and people mobility (4).

COVID- 19 virus does not have a vaccine yet, and the best way for prevention is by avoiding to be exposed to the virus as it spread through contact with infected persons and materials (3,5,6). As the virus continued to spread, many countries in the world declared the health emergency followed by restriction of movement and call/ enforce social distance measurements such as the closure of schools, markets ...etc. These measures have led to economic and social disruption worldwide.

The first coronavirus case was declared in Sudan on 12 March 2020. Since then many cases were reported. All of these cases had a recent history of travel to affected countries and close contact with a person retaining from countries with reported cases. The government closed all land crossings and airports and announced a public health emergency (7). On 18th of April, 2020, the Sudanese government commanded total lockdown for 3 weeks in Khartoum (the capital of Sudan where most of the cases were discovered) to delay the transmission of disease. The government complained of the poor commitment of the community to the health emergency, especially during the allowed hours. To the time of writing this paper; May 6, 2020; the number of diagnosed COVID-19 cases in Sudan were 852 with 80 cases recovered and 49 deaths (8).

The aim of this study was to assess the knowledge, attitudes and practices of the Sudanese towards COVID-19, to identify the sources of information and to evaluate the impact of preventive measures before the lockdown on the population.

Subjects And Methods

This is a descriptive cross-sectional online study conducted through an online self-administered questionnaire targeting adult Sudanese people living inside and outside Sudan. The questionnaire was disseminated through the personal network of the

investigators using social media such as Facebook and WhatsApp. The data was collected in the period from April 7, 2020, to April 13, 2020. By the end of the period, 1030 questionnaire were collected; of them, 987 were included in the final analysis.

Data collection tool: The questionnaire consisted of 29 items and divided into two parts (attached in the supplementary appendix). The first part investigated demographic variables and general information including age, gender, residence, and education status. The second part consisted of 4 knowledge questions (mode of transmission, symptoms, at-risk groups, preventive measures); 5 attitude questions (the danger of the disease, handwashing, masks use, social distancing and isolation of diseased patients) and 3 practices questions (handwashing, social distancing and handshaking) there were also questions about family and neighbour's practices regarding the use of mask and social distancing.

Data management: Data was cleaned and those gave no consent and duplicate samples were removed the total number of eligible questionnaires was 987. The knowledge, attitude and practices were scored. In the knowledge score, the questions were given equal marks and then were considered as having good knowledge when scoring more than 60% of the answers. Questions were then computed and then those scored 2 and more out of 4 were considered as having good knowledge. Attitude score was calculated by giving "yes answer" one score and "no or maybe answer" zero scores and then computing the five questions together, those who scored four or more were considered as having a good attitude. Regarding the practices, each of the three practices was given one score and those who scored two or more were considered as having good practice. For family practice, each was given an equal score (one or zero) and then those who scored two or more were considered as having good practice. Regarding the neighbours practice the social distancing were given a higher score than face mask use, and then those who scored for both or for social distancing alone were considered as having good practice while those scored for face mask alone or no score were considered to have poor practice.

Data analysis: Data was analyzed using IBM SPSS version 25. Frequencies were described for all independent and dependent variables. Then cross-tabulation using a chi-square test to determine the association between knowledge, attitude and practice and the independent variables of age, gender, and residence and education status was done. Binary regression was used to determine factors associated with the practice. Statistical significance level was set at $p < 0.05$.

Results

The mean (SD) age of the study sample was 30.13 years (9.84). Males represent 55.4% of them. The majority of the responders were university and higher education level (95.2%) and most of them were residing in Khartoum state (Table 1).

The overall knowledge of the participants about COVID-19 was rated as good in 90.6 % with a mean (SD) score of 3.55 (0.870). The overall attitude was found to be good in 81.8% of the participants with a mean (SD) score of 4.14 (0.974). Those who classified as having good overall practice among respondents were 89.8% with mean (SD) score of 2.16 (0.596). Family practices were good in 72.4% with a mean (SD) score of 1.97 (0.731), while neighbors practices scored good in 63.4% by the participants with mean (SD) score of 1.86 (0.947)-Table 1. It is worth to mention, 89% of the study population stated that the health education messages were clear for them. The sources of information for the COVID-19 were mainly (78.5%) from the official announces of Federal Ministry of Health, World Health Organization, social media and mass media.

The overall knowledge was not associated with age, gender or area of residence but there was significant association between knowledge score and the education level (p -value = 0.001). The overall attitude was found to be associated with sex only, where females had better attitude (p value = 0.02). Personal practices were found to be associated with sex where females scored higher than males (p -value = 0.003) and associated with residence (p -value = 0.001). When knowledge was correlated with attitudes, there was significant association (p -value = 0.005) and significant association was found between good attitude and practice (p -value = 0.002)- Table 2.

Regarding the effect of the preventive measures taken to delay the spread of the disease, 40.7% of the population expressed major changes in their life (Table 1). This was significantly associated with age as those more than 50 years old more affected (p -value=0.001), and area of residence (p value = 0.001)-Table 3. Binary logistic regression revealed an association between overall good practice and gender, education, residence and attitude (Table 4).

Further analysis of specific items in attitude and practice such as hand washing and social distancing (data not shown), revealed that females have significantly more positive attitude towards hand washing. In addition, the practice of social isolation is significantly associated with gender and residence.

Table 1: Sociodemographic characteristics, overall knowledge, attitude and practice of the participants (n= 987)

Variables	Description	Frequency	Percentage (95% CI)
Age in years	Less than 30	576	58.4% (55.3 - 61.4)
	30-40	262	26.5% (23.8 - 29.4)
	41-50	101	10.2% (08.4 - 12.3)
	More than 50	42	04.3% (03.1 - 05.7)
Gender	Male	549	55.6% (52.5 - 58.8)
	Female	438	44.4% (41.2 - 47.5)
Education level	Basic education	43	04.4% (03.2 - 05.8)
	High education	940	95.2% (93.7 - 96.5)
	Non formal education	4	00.4% (00.1 - 01.0)
Residence	Khartoum state	708	71.7% (68.8 - 74.5)
	Other states	168	17.0% (14.7 - 19.5)
	Outside Sudan	111	11.2% (09.3 - 13.4)
Overall personal Knowledge	Poor	93	09.4% (07.7 - 11.4)
	Good	894	90.6% (88.6 - 92.3)
Overall personal attitude	Poor	180	18.2% (15.9 - 20.8)
	Good	807	81.8% (79.2 - 84.1)
Overall personal practice	Poor	101	10.2% (08.4 - 12.3)
	Good	886	89.8% (87.7 - 91.6)

Overall family practice	Poor	272	27.6% (24.8 – 30.5)
	Good	715	72.4% (69.5 – 75.2)
Overall neighbors practice (n=576)	Poor	211	36.6% (32.7 – 40.7)
	Good	365	63.4% (59.3 – 67.3)
Effects of adopted measures on the routine life	No effect	72	07.3% (05.8 – 09.1)
	Minor effect	319	32.3% (29.4 – 35.3)
	Major effect	402	40.7% (37.6 – 43.9)
	Cannot evaluate	194	19.7% (17.2 – 22.3)
Perception of participants towards the methods od spread of COVID-109 in Sudan	bad attitudes such as open sneezing and coughing	894	90.6%
	social gatherings	932	94.4%
	gatherings at bakeries	918	93.0%
	gatherings at markets	881	89.3%
	public transportation	922	93.4%

Table 2: Cross-tabulation to show the relation between knowledge, attitude and practice with socio-demographic characteristics

Variables	Description	Knowledge				Attitude				Practice			
		Good	Poor	x2	p-value	Good	Poor	x2	p-value	Good	Poor	x2	p-value
Age in years	< 30	513	63	4.47	0.214	465	111	.44	0.696	507	69	7.34	0.062
	30-40	245	17			217	45			239	23		
	41-50	93	8			85	16			97	4		
	> 50	38	4			36	6			39	3		
Sex	Male	501	48	0.67	0.413	435	114	5.30	0.021	479	70	8.54	0.003
	Female	393	45			372	66			407	31		
Educational level	Basic	32	11	14.11	0.001	34	9	2.96	0.228	36	7	2.78	0.249
	Higher	858	82			771	169			847	93		
	Non-formal	4	0			2	2			3	1		
Residence	Khartoum	639	69	1.45	0.486	578	130	2.43	0.297	632	76	13.72	0.001
	Other states	151	17			133	35			144	24		
	Outside Sudan	104	7			96	15			110	1		
Overall knowledge	Poor									802	92	0.04	0.853
Overall attitude	Good									84	9		
Overall knowledge	Poor									736	71	9.92	0.002
Overall attitude	Good									150	30		

Table 3: Cross-tab to show the relation between the effect of preventive measures and socio-demographic characteristics

Variables	Description	Effect of the preventive measures				Chi-square	p-value
		Major effect	Minor effect	No effect	Cannot evaluate		
Age in years	<30	207	189	52	128	30.53	0.001
	30-40	113	85	14	50		
	41-50	54	31	4	12		
	>50	27	12	0	3		
Gender	Male	228	189	37	95	5.89	0.117
	Female	174	130	35	99		
Education level	Basic	17	12	3	11	4.90	0.556
	Higher	385	305	68	182		
	Non-formal	0	2	1	1		
Residence	Khartoum state	283	237	56	132	27.03	0.001
	Other states	54	53	13	48		
	Outside Sudan	65	29	3	14		

Table 4: Binary logistic regression to show the relation between the overall practice with socio-demographic characteristics, overall knowledge and attitude

Variables	Description	Overall practice		Odd Ratio (95% CI)	<i>p-value</i>
		Poor	Good		
Age in years	<30 (Ref. value)	507	69	1	
	30-40	239	23	0.955 (0.335- 2.721)	0.932
	41-50	97	4	1.359 (0.459- 4.026)	0.580
	>50	39	3	2.714 (0.649- 11.346)	0.171
Gender	Male	479	70	0.456 (0.287- 0.724)	0.001
	Female (Ref. value)	407	31	1	
Education level	Basic (Ref. value)	36	7	1	
	Higher	847	93	6.618 (1.791- 24.462)	0.005
	Non-formal	3	1	11.584 (3.773- 35.568)	0.001
Residence	Khartoum (Ref. value)	632	76	1	
	Other states	144	24	01.160 (0.700- 1.923)	0.565
	Outside Sudan	110	1	15.580 (2.046- 118.613)	0.008
Overall knowledge	Poor (Ref. value)	802	92	1	
	Good	84	9	1.341 (0.625- 2.876)	0.452
Overall attitude	Poor (Ref. value)	736	71	1	
	Good	150	30	0.557 (0.343- 0.905)	0.018

Discussion

This study was done in a time of a quickly changing evidence and rapid spread of the coronavirus as at the start of this study many recommendations have changed in prevention and treatment. The study was done among the Sudanese population using smartphones and social media that explain why the majority of the population were young, living in Khartoum state and were university or highly educated. This was also the case in the quick online survey done in China (6) where the majority of respondent were young.

The knowledge of the population was very high and this may be attributed to the access to the internet and their high level of education. It can be also a result of the fact that the disease is new and serious pushing for active learning from various sources (6). Our finding is not with an agreement with what was found in a multinational study done in the middle east (9). It is worth noting that subjects with non-formal education had 100% good knowledge probably self-learning process is highest among this category. Further analysis of the data (supplementary) revealed that university-educated personnel had better knowledge compared with participants with basic education which is consistent with the study done in Bangladesh (10). In this study, there was no association between knowledge and other sociodemographic factors unlike the other studies (6,11,12). It was noted that poor knowledge is associated with a poor attitude, and that poor attitude led to poor practices. This finding is consistent with the study done in China and indicates the importance of continuous improvement of the population knowledge through health education(6).

The attitude of the participants was generally good, especially among females. This is consistent with a study conducted among university students in China (13) unlike the report from Tanzania that showed no gender difference and no education difference (11).

This study demonstrated clearly that the area of residence affects the practice related to the preventive measures especially in those outside Sudan. This might be explained by accessibility to hygiene materials and strict regulations. Poor attitude and practices were significantly associated with male gender and basic education level. Males tend to take more risky behaviours which is consistent with other studies (6,12).

Despite the good attitude and practices; the behaviour of the Sudanese people can be unpredictable regarding social gathering. More than 90% of the study population think that social gatherings and unhygienic practice plus over-crowdedness in the public services areas can contribute to the transmission of the virus.

This study showed that people older than 50 years were most affected by the preventive measures, even though this study was done before the 3 weeks lockdown, it is interesting that the effect of the preventive measures was linked with age groups and reduced as the age becomes younger.

Conclusions

The strength of this study lies in assessing the practice of the family and neighbours as a mirror to the Sudanese community. This study has shown that there was good knowledge, attitude and practices among the participants who are mostly young and educated. Females tend to be superior in their attitudes and practices. Poor attitude and practice are associated with male gender and basic education.

Limitations

The study was conducted while the country has started adopting restrictive measures and thus researchers forced to use online survey methods with its limitations. Access of smartphones and internet is known to be high and middle socioeconomic classes and among younger age groups and urban areas. Further community-based studies are needed, maybe after the end of the pandemic.

Declarations

Ethical approval: The technical approval and ethical clearance were obtained from the Nahda Research Committee (Institution Review Board –IRB). Informed consent was taken from each participant, participation was voluntary, and the data of the participants was kept confidential.

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 declares that they have no competing interests

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Author's contribution

Study design AM, EMM. Implementation of the study AM, EM, AAM, HAE, MAM, MES, MIB, RBA, WII, EAM. Statistical analysis AM, AOM, AAM, HAE, MAM, MES, MIB, RBA, WII, EMM. Manuscript drafts AM, EMM, EAM, AOM

All authors read and approved the final manuscript

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