Assessing Uptake of COVID-19 Preventive Measures among Persons Aged 13-80 Years during Lockdown in Wakiso, Uganda: A Cross-Sectional Study

Alex Daama[1,2,3)], Fred Nalugoda[1,2)], Edward Nelson Kankaka[2)],
Robert Bulamba Malyabe[1)], Nkale Menya James[1)],
Stephen Mugamba[1)], Emmauel Kyasanku[1)], Juliana Namutundu[3)],
Gertrude Nakigozi[1,2)], Godfrey Kigozi[1,2)]

[1)]Africa Medical and Behavioral Sciences Organization, Nansana Uganda
[2)]Rakai Health Sciences Program, Kalisizo, Uganda
[3)]Makerere University School of Public Health, Kampala, Uganda

ABSTRACT

Background: The unprecedented spread of COVID-19 presents a serious public health concern. However, uptake of COVID-19-related preventive behaviors remains unknown. This study aimed to investigate current uptake of COVID-19 preventive measures and their associated factors in Wakiso, Uganda.

Subjects and Method: A cross-sectional study was conducted in Wakiso, Uganda from April to September 2020. A total of 1,014 study subjects aged 13–80 years in the population health survey (PHS) who self-reported following any of the COVID-19 preventive behavioral strategies during lockdown was selected. The dependent variable was COVID-19 preventive measures. Independent variables were gender, age, education, marital status, religion, occupation. The data were collected by questionnaire and analyzed using Modified Poisson regression test.

Results: Female (aPR=1.48; 95% CI= 1.34 to 1.62; p<0.001), construction and mechanics workers (aPR=1.23; 95% CI= 1.10 to 1.38; p<0.001), housework (aPR= 0.72; 95% CI= 0.64 to 0.81; p <0.001), and students (aPR=0.58; 95% CI= 0.45 to 0.74; p<0.001) were associated with staying at home. Aged 45-54 years old (aPR=0.55; 95% CI= 0.50 to 0.61; p<0.001), more than 55 years (aPR=0.80, 95% CI= 0.66 to 0.97; p= 0.022), and housework (aPR=1.18; 95% CI= 1.03 to 1.35; p= 0.015) were associated with sanitize often.

Conclusion: Female, construction and mechanic workers, housework, and student are associated with staying at home and it is statistically significant. Aged 45-54 and more than 55 years old, housework were associated with sanitize often and it is statistically significant.

Keywords: preventive measures, COVID-19, Wakiso, Uganda

Correspondence:
Alex Daama. Africa Medical and Behavioral Sciences Organization (AMBSO). Plot 7441, Nansana, Hoima Road, Wakiso, Uganda P.O Box 25974. Email: daamaalex6141@gmail.com. Mobile: +256702347102

BACKGROUND

Globally, since December 2019 there is a public health significant outcry due to effects caused by COVID-19. Uganda like many other sub-Saharan African countries put in place different public health prev-

entive measures for COVID-19 pandemic. Due to her limited resources with already a struggling health care system, COVID-19 tends to pose a huge threat and difficult to respond to, due to its unique way of spread from person-to person. The virus is spread through respiratory droplets, direct physical contact with the infected person and contaminated objects (Chan et al., 2020). What possess a major worry and threat to the nationals and public health professionals is that infected persons with signs and symptoms including those in asymptomatic state can transmit the virus (Gao et al., 2020).

Since there is no pharmaceutical effective interventions for this virus, WHO recommended the following measures to curb spread of the virus in urban settings and these included: wearing masks, limiting physical contact in social gatherings including closing public places, institutions like schools, hand washing, lockdown and indeed this being the first time worldwide to have travel restrictions, total lockdown, school closure (WHO, 2020).

Uganda like many as other countries implemented a wide range of COVID-19 measures including frequent hand washing, avoiding crowded places, wearing a mask when out of the house, observing social distancing, 2m apart, always staying at home, sanitizing often, and reporting suspicious people as a COVID-19 preventive strategy to prevent the COVID-19. According to WHO global COVID-19 dashboard, as 15th September 2020, there have been 29,155,581 confirmed cases of COVID-19, including 926,544 deaths, over 60% of these contributed by America and Europe. In Africa by 15th, September 2020, South Africa had the leading confirmed cases of COVID-19 (650,749) with 15,499 deaths, followed by Ethiopia confirmed cases (64,786) with (1,022) deaths, Nigeria with

(56,388) confirmed cases and (1,083) higher deaths than Nigeria (WHO,2020).

Uganda given her previous history with Ebola virus disease had built surveillance health systems with stringent strategies like screening border points and contact tracing and used some of these to aid implementation of WHO guidelines since 19th, March 2020 in fact with zero confirmed case of COVID-19 (Aceng et al., 2020). These strategies indeed helped to identify her first COVID-19 confirmed case on 21 March 2020. COVD-19 Samples that were taken off on 24 March 2020 from travelers, 14 of them were confirmed and only 05 of the confirmed cases were detected using the symptom screening at the airport. Due to asymptomatic manifestation of the disease the 09 cases could not be detected given inefficiency use of thermal screening at the airport (Quilty et al., 2020). Up to date, screening and contact tracing in the country has remained a priority. However, despite the country's efforts to implement WHO preventive measures, Uganda's confirmed cases (38,085) and deaths (304) continue to rise every other day (WHO, 20-20). Therefore, there is need to assess uptake of the COVID-19 measures in a bid to minimize the spread of the virus

Studies conducted in Turkey and Chinese indicated that sex is one of the factors associated with suboptimal uptake of COVID-19 preventive measures (Zhong et al.,2020; Yıldıım and Güler, 2020). Age and marital status influenced uptake of COVID-19 preventive measures(Li et al., 2020). Besides that, another study from South Korea coiled that higher education level was associated with uptake of COVID-19 preventive measures (Lee and You 2020).

Some of the COVID-19 preventive measures like social distancing indeed infringe on the culture and socio-economic

norms of most Ugandans. As a matter of fact, most Ugandans rely on paid jobs on firms for daily survival, boda-boda riding, bars, betting companies and usually gather in churches including mosques in large numbers. Therefore, we do not know whether there is compliance for the COVID-19 preventive measures. This study aimed to assess uptake, potential reasons suboptimal uptake, and associated factors by Ugandans on COVID-19 guidelines.

SUBJECTS AND METHOD

1. Study Design
This was a cross-sectional study conducted in Wakiso, Uganda, from April to September 2020.

2. Population and Sample
The population studied was all person aged 13-80 years in Wakiso, Uganda from April to September 2020. Sampling was carried out by total sampling.

3. Study Variables
The dependent variables included always staying at home and sanitize often. The independent variables included socio-demographic characteristics like gender, age, education, marital status, religion, occupation, potential reasons for low uptake of COVD-19 measures.

4. Operational Definition of Variables
COVID-19 is defined as illness caused by a novel coronavirus which is currently referred to as severe acute respiratory syndrome coronavirus 2 (SARS-COV-2).

COVID-19 preventive measures are defined as behavioral control interventions that were instituted by World Health Organization (WHO) to prevent spread of Coronavirus. These include frequent hand washing, avoiding crowded places, wearing a mask when out of the house, observe social distancing, 2 m apart, always staying home, sanitize often, and reporting suspicious people.

5. Study Instruments
The data is in the form of primary data and secondary data. Primary data involved re-contacting participants who were previously interviewed through a phone call interview using a questionnaire. Secondary data were obtained from retrieval of population health survey data (PHS). The instrument used was a questionnaire.

6. Data Analysis
Univariate analysis was carried out to see the frequency distribution and characteristics of the research subjects, while multivariate analysis was carried out using Poisson regression.

7. Research Ethic
Research ethic includes informed consent, anonymity, confidentiality and ethical clearance. The ethical clearence in this study was conducted at Clerk International University, Uganda and was declared ethical based on decree number UG-REC-015-CIURE/0059

RESULTS

1. Univariate Analysis
The majority of subjects were female (54.83%). Most of the subjects were aged 13-34 years were 654 people (64.5%), in terms of subjects had a post primary education level as many as 488 (48.13%), with most of the participants were doing agriculture (29.98%) and most of the subjects were Christians as many as 760 people (74.95%) (Table 1)

Table 1. Characteristics of study subjects

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	458	45.17
Female	556	54.83
Age group (year)		
13-34	654	64.5
35-44	154	15.19
45-54	115	11.34
More than 55	91	8.97
Education level		
None	40	3.94
Primary	486	47.93
Post primary	488	48.13
Occupation		
Agriculture	304	29.98
Trading	202	19.92
Housework	193	19.03
Construction and mechanics workers	112	11.05
Students	103	10.16
Other	100	9.86
Religion		
None	9	0.89
Christians	760	74.95
Muslims	245	24.16

Table 2. Prevalence of uptake of COVID-19 preventive measures during lockdown

COVID-19 Preventive strategies	Uptake of COVID-19 Public Preventive Measures			
	YES		NO	
	n	%	n	%
Frequent hand washing	1,009	99.51	5	0.49
Avoiding crowded places	989	97.53	25	2.47
Wearing a mask when out of the house	965	95.17	49	4.83
Observe social distancing, 2m apart	959	94.58	55	5.42
Always staying home	741	73.08	273	26.92
Sanitize often	642	63.31	272	36.69
Reporting suspicious people	27	2.66	987	97.34
Other measures	60	5.92	954	94.08

Table 2 showed uptake/adoption of COVID-19 preventive behavioral strategies during Ugandan lockdown. Generally, uptake of COVID-19 preventive behavioral strategies was high 897 (88.46%). Majority of the participants reported (99.51%) frequent hand washing, (97.53%) avoiding crowded places, (95.17) wearing a mask when out of the house, (94.58) observing social distancing, 2m apart respectively. While COVID-19 preventive behavioral strategies that had suboptimal uptake included always staying at home (73.08%), sanitizing often (63.31%), reporting suspicious people (2.66%), and other measures (5.92%).

Table 3. Potential Reason for suboptimal uptake of COVID-19 preventive measures during lockdown

Potential Reason Items	n	%
Not Always Staying At Home		
I can't stay at home because I need to work for daily living		
YES	265	97.07
NO	8	2.93
I can't stay at home because I am avoiding quarrels with my partner		
YES	0	0
NO	273	100
I don't stay at home because I don't think we have COVID in community		
YES	4	1.47
NO	269	98.53
Not sanitizing		
I don't sanitize because I have no sanitizer		
YES	48	90.57
NO	5	9.43
I don't sanitize because I believe hand washing is enough		
YES	4	7.55
NO	49	92.45
Not reporting suscipous people		
I would report suspicious people, but I have not seen/ heard anyone sick		
YES	51	100
NO	0	0
I would report suspicious people, but it is expensive for one to isolate		
YES	0	0
NO	51	100
I would report suspicious people, but I do not know signs/symptoms of COVID-19		
YES	0	0
NO	51	100

Table 3 showed the reasons for low uptake of sanitizing often and always staying at home. Of the 273 who reported not always staying at home as one of the COVID-19 preventive measure, 97.07% reported that they could not stay at home because they needed to work for daily living while 1.47% reported that they did not stay at home because they did not think they had COVID-19 in their community. Therefore, there is need to support families with basic needs like food to increase uptake of this strategy. Majority of the participants (90.57%) reported that they did not sanitize because they did not have sanitizer while (07.55%) believed that hand washing was enough, all participants (100%) reported that they had not seen or heard anyone sick as a potential reason for not reporting suscipous people.

2. Multivariate Analysis
Based on Table 4. it can be seen that variety of factors contribute to always staying home as a COVID-19 preventive behavioral strategy, in multivariable model sex and occupation were associated with staying home,

female respondents were more likely to always staying at home compared to males (aPR= 1.48; 95% CI= 1.34 to 1.62; p <0.001), subjects who were engaged in construction and mechanics were more likely to stay at home compared to those in agriculture (aPR= 1.23; 95% CI= 1.10 to 1.38; p<0.001), while participants who were doing housework (aPR= 0.72; 95% CI= 0.64 to 0.81; p<0.001) and students were less likely to stay at home (aPR=0.58; 95% CI= 0.45 to 0.74; p<0.001).

Table 5 showed a variety of factors contribute to sanitizing often as a COVID-19 preventive behavioral strategy, in multivariable gender age and occupation were associated with sanitizing more specifically, female respondents and participants aged 45-54 years old (aPR=0.55, 95% CI= 0.50 to 0.61; p<0.001) and more than 55 years (aPR=0.80, 95% CI= 0.66 to 0.97; p= 0.022), participants who were doing housework were more likely to sanitize often (aPR= 1.18; 95% CI= 1.03 to 1.35; p=0.015).

Table 4. Multivariable results for factors associated with staying at home during Ugandan lockdown among persons aged 13-80 years

Variables	Adoption of Always staying at home as COVID-19 behavioral strategy (n=1,014) during Ugandan lockdown					
	No (%)	Yes (%)	Unadjusted Prevalence ratio (cPR)	p	Adjusted Prevalence Ratio (aPR)	p
Gender						
Male	205 (44.76)	253 (55.24)	1.00	0.000	1.00	<0.001
Female	68 (12.23)	488 (87.77)	1.59 (1.45-1.74)		1.48 (1.34-1.62)	
Age group (year)						
13-34	177 (27.06)	477 (72.94)			1.00	
35-44	44 (28.57)	110 (71.43)	0.98 (0.88-1.09)	0.711	0.98 (0.89-1.09)	0.710
45-54	27 (23.48)	88 (76.52)	1.05 (0.94-1.17)	0.399	1.06 (0.94-1.19)	0.341
55 +	25 (27.47)	66 (72.53)	0.99 (0.87-1.14)	0.935	0.98 (0.86-1.12)	0.788
Education						
None	12 (30)	28 (70.00)	1.00		1.00	
Primary	127 (26.13)	359 (73.87)	1.06 (0.86-1.30)	0.615	1.03 (0.87-1.24)	0.713
Post primary	134 (27.46)	354 (72.54)	1.04 (0.84-1.28)	0.740	1.05 (0.88-1.26)	0.577
Religion						
None	1 (11.11)	8 (88.89)	1.00		1.00	
Christians	202 (26.58)	558 (73.42)	0.83 (0.65-1.04)	0.111	0.89 (0.70-1.13)	0.332
Muslims	70 (28.57)	175 (71.43)	0.80 (0.63-1.03)	0.079	0.86 (0.68-1.10)	0.235
Occupation						
Agriculture	54 (17.76)	250 (82.24)	1.00		1.00	
Trading	12 (6.22)	181 (93.78)	1.14 (1.07-1.22)	0.000	1.03 (0.96-1.11)	0.395
Housework	80 (39.60)	122 (60.40)	0.73 (0.65-0.83)	0.000	0.72 (0.64-0.81)	0.000
Construction and mechanics workers	12 (11.65)	91 (88.35)	1.07 (0.98-1.17)	0.108	1.23 (1.10-1.38)	0.000
Students	69 (61.61)	43 (38.39)	0.47 (0.37-0.59)	0.000	0.58 (0.45-0.74)	0.000
Other	46 (46.00)	54 (54.00)	0.66 (0.54-0.79)	0.000	0.72 (0.61-0.87)	0.000

Table 5. Multivariable results for factors associated with Sanitizing during Ugandan lockdown among persons aged 13-80 years

Variables	Adoption of "Sanitize often" as COVID-19 behavioral strategy (n=1,014) during Ugandan lockdown					
	No 372 (36.69%)	Yes 642 (63.31%)	Unadjusted Prevalence ratio(cPR)	p	Adjusted Prevalence Ratio(aPR)	p
Gender						
Male	70 (15.28)	388(84.72)	1.00		1.00	
Female	302(54.32)	254(45.68)	0.54(0.49-0.60)	0.000	0.55(0.50-0.61)	0.000
Age group (year)						
13-34	209(31.96)	445(68.04)	1.00		1.00	
35-44	68(44.16)	86(55.84)	0.82(0.71-0.95)	0.010	0.89 (0.78-1.03)	0.119
45-54	51(44.35)	64(55.65)	0.82(0.69-0.97)	0.022	0.86 (0.73-1.02)	0.085
55 +	44(48.35)	47(51.65)	0.76(0.62-0.93)	0.009	0.80(0.66-0.97)	0.022
Education						
None	20(50.00)	20(50.00)	1.00		1.00	
Primary	196(40.33)	290(59.67)	1.19(0.87-1.64)	0.277	1.11(0.84-1.47)	0.473
Post primary	156(31.97)	332(68.03)	1.36(0.99-1.87)	0.056	1.17(0.89-1.55)	0.261
Religion						
None	5 (55.56)	4 (44.44)	1.00		1.00	
Christians	297(39.08)	463 (60.92)	0.83(0.65-1.04)	0.399	1.42(0.84-2.39)	0.187
Muslims	70(28.57)	175 (71.43)	0.80(0.63-1.03)	0.206	1.63(0.97-2.75)	0.067
Occupation						
Agriculture	137 (45.07)	167 (54.93)	1.00		1.00	
Trading	102 (52.85)	91 (47.15)	0.86 (0.72-1.03)	0.098	0.96 (0.80-1.15)	0.625
Housework	64(31.68)	138 (68.32)	1.24 (1.08-1.43)	0.002	1.18 (1.03-1.35)	0.015
Construction and Mechanism	18 (17.48)	85 (82.52)	1.5 (1.31-1.72)	0.000	1.08 (0.94-1.25)	0.269
Students	25 (22.32)	87 (77.68)	1.41 (1.23-1.63)	0.000	0.98 (0.85-1.14)	0.827
Other	26 (26.00)	74 (74.00)	1.35 (1.15-1.57)	0.000	1.09(0.94-1.27)	0.258

DISCUSSION

We investigated uptake of COVID-19 preventive behavioral strategies, determined potential reasons for suboptimal uptake and associated factors. Our findings revealed that uptake of individual preventive behavioral strategy varied, uptake of COVID-19 preventive measures among Ugandans varied, uptake was generally high. This finding is consistent with a study in Singapore (Ozdemir *et al.,* 2020). This could partly be explained by numerous government efforts in sensitizing masses about the dangers of the pandemic for example through regular TV shows by the president and this is also consistent with Usman Ibe Michael Ssempijja' s study that

demonstrated high level of knowledge among Ugandans concerning COVID-19 (Usman et al., 2020). The most widely adopted preventive behavioral strategies to avoid COVID-19 in our study was frequent hand washing (99.51%), avoiding crowded places (97.53%). These proportions are higher than a Malaysia COVID-19 study that indicated that avoiding crowds was at (83.4%) and practicing proper hand hygiene (87.8%) (Azlan et al., 2020).

Though our findings indicate high uptake of wearing a mask when out of house (95.17%) and observing social distancing, 2m apart (94.58%), this is not consistent with other findings from Ethiopia that indicate observing social distancing, 2m apart

(64.4%) and wearing masks at only 30.3% (Wondimu et al., 2020), this shows similar findings from Paschal Awingura in Ghana about COVID-19 study among students indicating less than 50% (46.2%) practicing social distancing and only 31.5% wore masks (Apanga et al., 2020). This could explain why Uganda had quite fewer COVID-19 cases at that time and during lockdown compared to her sister countries. However, adoption of always staying home, sanitize often, reporting suspicious people were not widespread (73.08%), (63.31%), (2.66%) respectively.

We investigated some of the potential reasons for each of these suboptimal uptakes of COVID-19 preventive behavioral strategies and for instance majority (97.07%) of the participants highlighted need to work for daily living as a major reason for not always staying home during COVID-19 lockdown. This can be explained by most Ugandans relying on paid jobs on firms for daily survival, boda-boda riding, bars, betting companies.

Potential reasons for low uptake of sanitizing often were that, majority of the Ugandans did not have sanitizers (90.57%) besides that, some Ugandans (07.55%) thought that frequent hand washing was enough hence consistent with Beiu, Cristina etal's study (Beiu et al., 2020)

In our findings, sex, age, and occupation were associated with sanitizing often as a COVID-19 preventive behavioral strategy. These findings disagree with Ghana COVID-19 study among students that shown that sex and age were not significantly associated (Apanga et al., 2020). We did not have any association between sanitizing often as a COVID-19 preventive measure and religion including education and this is in agreement with findings from Ethiopia (Wondimu et al., 2020) .

Besides that, we also found out that sex and occupation were the main factors associated with always staying home as a COVID-19 preventive measure during a Ugandan lockdown and this agrees with studies conducted in China and Turkey (Zhong et al., 2020; Yıldırım and Güler, 2020). However, we find no association between always staying home as a COVID-19 preventive measure during lockdown and religion, age, including education hence disagreeing with (Lee and You, 2020). However, these findings should be considered with some limitations, although uptake of COVID-19 preventive behavioral strategies was high consistent with government recommendations during lockdown.

There is need to note that these findings do not indicate adherence of COVID-19 preventive measures and the effectiveness of these practices in the COVID-19 outcomes in this population. Therefore, this serves as a fertile ground for future researchers to establish effectiveness of these practices among these same population through COVID-19 lab test and see if they are protected. Secondly, other scientists could also focus on adherence of these practices and thirdly, we believe this is also a great opportunity for future researchers to probably do qualitative and understand peoples feelings and perceptions for COVID-19 preventive practices more especially suboptimal practices.

Some studies indicate low prevalence of uptake of COVID-19 preventive behavioral strategies, this could be limited to power of the study, but the power of our study is high and therefore these findings are more generalizable. In conclusion, during lockdown, uptake of COVID-19 preventive behavioral strategies overall, was high consistent with government recommendations though there are some variations per strategy.

Therefore, to follow social restrictions, it is hoped that the government will be more passive in disseminating health by involving all parties, either directly or with the media.

AUTHOR CONTRIBUTION

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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