



Level and Determinants of Adherence to Covid-19 Preventive Measures in the First Stage of the Outbreak In Uganda

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Summary

On 18 March 2020, the President of Uganda banned public gatherings, and encouraged the public to observe physical distancing, use of masks, and personal hygiene. We conducted a survey in the first two months of the COVID-19 epidemic in Uganda to assess the level of adherence and determinants of adherence and satisfaction with the COVID-19 preventive measures recommended by government.

We conducted an online national cross-sectional survey between 16-30 April 2020 to collect socio-demographic, daily personal and professional information on adherence and satisfaction with COVID-19 preventive measures. We generated two composite outcome variables; 4-item and 5-item Likert scales for level of adherence and satisfaction, respectively using the four major variables: hand washing, wearing face masks, physical distancing, and coughing/sneezing hygiene. Adherence to all the four major preventive measures was categorized as high adherence. Similarly, satisfaction with all the four major preventive measures categorized as very satisfied. We used ordinal logistic regression to identify determinants of adherence and satisfaction to preventive measures.

We had 1,726 respondents (mean age: 36 years (range of 12 to 72); 1,015 (59%) males). Only 495 (29%) reported high adherence to the COVID-19 preventive measures. Overall, 1,555 (90%)



observed physical distancing and 566 (33%) always used face masks when going out.

Determinants of high adherence to preventive measures included: living in Kampala City Centre (AOR: 1.7, 95% CI: 1.1-2.6), receiving COVID-19 information from health workers (AOR: 1.2, 95% CI: 1.01-1.5) and receiving COVID-19 information from village leaders (AOR: 1.4, 95% CI: 1.02-1.9). Staying with siblings reduced the odds for high adherence (AOR: 0.75, 95%CI: 0.61-0.93).

Overall, 545/1,726 (32%) of the participants were very satisfied with the preventive measures. Satisfaction was highest with cough hygiene [1,251/1,726 (73%)], followed by hand washing [1,180/1,726 (68%)], and wearing face masks [520/1,726 (30%)]. Determinants of satisfaction with preventive measures included: being female (AOR: 1.3, 95%CI: 1.1-1.6), being a health worker (AOR: 1.2, 95%CI: 1.0-1.5) and being in second wealth quintile (AOR: 1.4, 95%CI: 1.02-1.9). Participants who reported violence or discrimination at home during the lockdown period (AOR: 0.25, 95%CI: 0.09-0.67) were less likely to be very satisfied with the COVID-19 preventive measures.

The overall level of adherence to and satisfaction with COVID-19 preventive measures was generally low, especially for face masks. Targeted behavioral change programs using health workers and community leaders are needed and especially need to target men, large families and communities outside Kampala.

Background

The Coronavirus Disease 2019 (COVID-19) caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) was declared to be a pandemic by the World Health Organization (WHO) in March 2020 [1]. Countries were urged to institute preventive strategies to minimize viral transmission. In Uganda, the government progressively instituted several stringent public health measures to prevent and contain any local COVID-19 epidemic. On March 18th 2020, the President banned all public gatherings, and encouraged the public to observe physical distance, not to cough, sneeze or spit in public, and to observe strict hygienic rules (hand washing with soap and water or using sanitizers, regularly disinfecting surfaces such as tables and door handles



among others) [2]. On March 20th 2020, all institutions of learning were closed and, on March 25th 2020, a ban on public transport was instituted. A 14-day total lockdown started on March 30th 2020 with a nationwide curfew from 7pm to 6.30am; the use of private cars was equally banned, except for essential staff. The lockdown was later extended until on June 2nd 2020 when a phased easing of the restrictions commenced.

So far, the adherence to these measures has not been evaluated. Understanding the acceptability by the population and the adherence to the preventive measures is essential for the containment of the COVID-19 epidemic in the long-term. We investigated to estimate the level and identify the determinants of adherence, as well as the population's satisfaction with respect to the COVID-19 preventive measures recommended by government.

Methods

We conducted an online national cross-sectional survey between 16- 30 April 2020 as part of the International citizen project (ICP) to assess adherence to preventive measures and their impact on the COVID-19 outbreak. The questionnaire collected information about socio-demographic characteristics; the impact of COVID-19 and associated restrictions on daily life, professional life, and personal well- being; adherence to personal and community preventive measures; and acceptability of these measures. People with access to internet either on smart phones or computers were able to voluntarily participate in the study by clicking on the link and anonymously submitting their responses.

To determine the overall level and determinants of adherence to the preventive measures, we generated a composite outcome variable called “overall level of adherence” using a 4-item Likert scale (1=very poor adherence to 4=high adherence). We generated this composite adherence outcome using the following four variables, each having a weight of 1: frequent hand washing (Many times in a day after contact with persons or surfaces), wearing face masks, physical distancing, and covering mouth or nose with tissue paper or fabric when coughing/sneezing. These four variables were selected since they were considered the most effective COVID-19 prevention measures [3]. Very poor adherence, which is represented by score 1 of the Likert



scale, meant that the person did not adhere to more than one of the four preventive measures. Poor adherence, score 2 of the Likert scale meant that the person was extremely satisfied with only one of the four preventive measures. Neutral, score 3 of the Likert scale meant that the person was extremely satisfied with only two of the four preventive measures. Satisfied, score 4 of the Likert scale meant that the person was extremely satisfied with only three of the four preventive measures. Extreme satisfaction with all the four preventive measures was categorized as very satisfied.

We generated a composite variable on wealth index quintiles using household-item possession variables like; possession of car, television set, radio, mobile phones, and bicycle.

We summarized the number of times of hand washing in a day and the extent of adoption of the preventive measures using mean and SD.

We used ordinal logistic regression to determine the factors associated with adherence and satisfaction with preventive measures. We considered p-value of <0.05 to determine the level of significance and a stepwise approach to ascertain the best fitting model.

Results

A total of 1,726 persons participated in the study, mean age of 36 years (range of 12 to 72). The majority of respondents (59%) were males; only 47 (3%) of participants were non-Ugandans. 51% were from Kampala, 40% were from other urban residences except Kampala, and 11% were from rural communities. Most [706/1,726 (41%)] of the respondents were in the age- group of 29-39 years and 215/1,726 (13%) were 50 years and above. Level of adherence to the COVID-19 preventive measures in first stage of the outbreak, Uganda Only 495 (29%) of participants were very adherent to the preventive measures. The least observed preventive measures were disinfecting phone (42%), Laptop (26%), bag (20%) and TV remote (18%). Mask use was also low (reported by only 33% of respondents); meanwhile, high adherence rates of 96% and 86% were noted for frequent hand washing and coughing hygiene, respectively (Table 1).



Determinants of adherence to the COVID-19 preventive measures in first stage of the outbreak, Uganda

In multivariable analysis, participants living in Kampala City Centre (AOR: 1.7, 95%CI: 1.1-2.6), those who obtained COVID-19 information from healthcare workers (AOR: 1.2, 95% CI: 1.01-1.5), those who obtained COVID-19 information from village leaders (AOR: 1.4, 95% CI: 1.02-1.9) or those worried of their own health (AOR: 1.5, 95% CI: 1.1-1.9) were more likely to highly adhere to the preventive measures. Staying with siblings reduced the odds for high adherence (AOR: 0.75, 95%CI: 0.61-0.93).

All other factors assessed including: being female, obtaining COVID-19 information from television, being in any religion, living as a couple, being health worker, working in a closed indoor space alone, and being in a highest wealth index quintile were not statistically associated with adherence to the COVID-19 preventive measures.

Table 1: Level of adherence to the COVID-19 preventive measures

Variables (N=1,726)	Response	Frequency (Percentage)
Observe physical distance restriction	No	171 (9.9)
	More than 1 meter	1,555 (90)
Wear face mask when going outside	No	1,160 (67)
	Yes	566 (33)
Cover mouth when cough or sneeze	No	248 (14)
	Yes	1,478 (86)
Disinfect hands after sneezing or coughing	No	415 (24)
	Yes	1,311 (76)
Frequent hand Washing	No	64 (3.7)
	Yes	1,662 (96)
Stay home when feel flu-like symptoms	No	293 (17)
	Yes	1,433 (83)



Shaking hands, giving a kiss or having any form of physical contact with someone other than a Housemate	No contacts with persons outside my household in last two weeks	1,048 (61)
	At least everyday	678 (39)
Adaptation of people's behaviours to comply to government instructions, on a 10point Likert score: Median (IQR)		7 (5-8)
Approximate number of times hands were washed or hand sanitizer used during the past day, median (IQR)		6 (5-10)
Overall score of adherence to preventive measures*	Very poor adherence	66 (3.8)
	Poor adherence	274 (16)
	Low adherence	891 (52)
	High adherence	495 (29)

**It is a composite variable generated from the four selected COVID-19 preventive measures*

Level of satisfaction with the COVID-19 preventive health measures in first stage of the outbreak, Uganda

Overall, 545/1,726 (32%) of the participants were very satisfied with the preventive measures. Whereas observing cough hygiene was the most [1,251/1,726 (73%)] extremely satisfying preventive measure and followed by hand washing with [1,180/1,726 (68%)], wearing face masks was the least [520/1,726 (30%)] (Table 2).

Determinants of level of satisfaction with the COVID-19 preventive measures in first stage of the outbreak, Uganda

In multivariable analysis, females (AOR: 1.3, 95%CI: 1.1-1.6), health care workers (AOR: 1.2, 95%CI: 1.02-1.5), and those in second wealth quintile (AOR: 1.4, 95%CI: 1.02-1.9) were very satisfied with the preventive measures. Participants who reported violence or discrimination at home during the lockdown period were less likely to be very satisfied with the COVID-19 the



preventive measures.

All other factors assessed including: being worried about own health, never suffering violence, and working in a closed in-door space with several people were not statistically associated with satisfaction with the COVID-19 preventive measures.

Table 2: Level of satisfaction with the COVID-19 preventive health measures in first stage of the outbreak, Uganda

Variables	Response	No. (percentage)
Stay at home	Extremely dissatisfied	134 (7.8)
	Dissatisfied	133 (7.7)
	Satisfied	348 (20)
	Moderate satisfied	403 (23)
	Extremely satisfied	708 (41)
Frequent hand washing with soap	Extremely dissatisfied	42 (2.4)
	Dissatisfied	40 (2.3)
	Satisfied	133 (7.7)
	Moderate satisfied	331 (19)
	Extremely satisfied	1,180 (68)
Physical distancing	Extremely dissatisfied	58 (3.4)
	Dissatisfied	76 (4.4)
	Satisfied	237 (14)
	Moderate satisfied	393 (23)
	Extremely satisfied	962 (56)
Wear a face masks	Extremely dissatisfied	240 (14)
	Dissatisfied	217 (13)
	Satisfied	420 (24)
	Moderate satisfied	329 (19)



	Extremely satisfied	520 (30)
Cover mouth or nose with tissue paper or fabric when coughing/ sneezing	Extremely dissatisfied	59 (3.4)
	Dissatisfied	39 (2.3)
	Satisfied	138 (8.0)
	Moderate satisfied	239 (14)
	Extremely satisfied	1,251 (73)
**Overall satisfaction	Very dissatisfied	289 (17)
	Dissatisfied	298 (17)
	Neutral	283 (16)
	Satisfied	311 (18)
	Very satisfied	545 (32)

** It is a composite variable generated from satisfaction level of each of the four major variables

Discussion

This study assessed the adherence to and satisfaction with COVID-19 prevention measures in the early phase of the out- break in Uganda. Only 29% adhered to all adherence measures although adherence to some measures was very high. Nearly all participants (96%) reported frequent hand washing with soap, but only 33% reported wearing a face mask when going out. It has been estimated that proper masks use with a cover- age of 80% would halt the transmission of the virus [4]. However, like other countries in Africa, masking is not commonly done and was only introduced in response to the COVID-19 pandemic. Low usage of masks could also be a result of the initial inconsistency in information about the value of mask use by the general population to prevent COVID-19 transmission [5]. Additionally, there was information that the threat of COVID-19 posed to Africa and Uganda will be mild given tropical environmental context and the largely young population structure [6]. Furthermore, many poor people may not be able to buy masks since the Uganda's economy has been affected by COVID-19 [7].

More sensitization regarding the importance of face masks use in containing the COVID-19 pandemic is clearly needed as well as subsidies and free masks for those who may not be able to afford them. Living in Kampala City Centre was associated with high adherence to preventive



measures. This is probably explained by the fact that the first cases appeared in Kampala, and that people in Kampala were more exposed to information about COVID-19 than elsewhere. Respondents who reported living in a household with other siblings were less likely to adhere to the preventive measures. This could be because young people have a low risk perception to COVID-19 [8], and for them physical distancing may be difficult. In addition, larger families may have more financial and space constraints.

Receiving COVID-19 related information from health workers was also associated with good preventive behavior. The country's Ministry of Health through its decentralized systems used health workers to sensitize the public on COVID-19 through various fora, including community outreaches. The population is more likely to trust information from health workers and other trusted source [9]. Worry about one's health was also associated with high adherence to the preventive measures. This concurs with findings from a Canadian study, which described how concerns about health status may be associated with adherence to disease preventive measures [10].

Risk perception is indeed an important determinant of adoption of health promotion and preventive measures generally but has been a major challenge in COVID-19 due to widespread misinformation and disinformation, which downplays the risk of COVID-19 [8].

Satisfaction with the preventive measures was associated with adherence to the measures. This is not only surprising, but also highlights the need to ensure that trust and satisfaction is maintained to sustain the adherence to prevention [11]. This coupled with perception of the effectiveness of preventive COVID-19 prevention measures should be integrated within the COVID-19 risk communication and community engagement especially for the men who had lower satisfaction and adherence levels than the women [11, 12]. Men generally have more challenges and poorer health seeking behaviors and less contact with the healthcare system [13]. Of note, is that the participants who experienced violence had lower satisfaction, perhaps because the violence could have been related to enforcement of the preventive measures [14]. Punitive measures in ensuring adherence to COVID-19 measures is an emerging area of concern that has not been fully explored and requires more research.



Conclusion

Relatively low proportions of respondents adhered to all the recommended preventive measures, and adherence was especially low concerning the use of masks. The proportion of respondents who were very satisfied with preventive measures was also low. Behavior change programs need to be intensified to improve the level of adherence and satisfaction with preventive measures, especially use of masks. Special messages and efforts should target men, large families and people living outside Kampala city Centre and popularized at community level by health workers and community leaders.

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