



High level of compliance to handwashing during the early phase of COVID-19 epidemic in Uganda: A nationwide cross-sectional survey

Authors: Richard Migisha^{1*}, Bob Omoda Amodan¹, Lilian Bulage¹, Elizabeth B. Katana¹, Joseph N. Siewe Fodjo², Robert Colebunders², Alex Riolexus Ario^{1,3}, and Rhoda K. Wanyenze⁴

Affiliations;

¹Uganda Public Health Fellowship Program, Ministry of Health, Kampala, Uganda

²Global Health Institute, University of Antwerp, Doornstraat 331, 2610 Antwerp, Belgium

³Ministry of Health, Kampala, Uganda

⁴School of Public Health, College of Health Sciences, Makerere University, Kampala, Uganda

*Correspondence: rmigisha@musph.ac.ug

Summary

The World Health Organization recommends frequent handwashing with soap and water as the cheapest and most essential intervention in preventing the spread of COVID-19. We assessed the level of compliance to handwashing and associated factors among Ugandans in the first two months of the outbreak in the country to inform prevention measures.

We abstracted data from the International Citizen Project (ICP), a cross-sectional nationwide online survey conducted between 16th and 30th April 2020 using a self-administered questionnaire. We collected data on socio-demographic characteristics, the impact of COVID-19 on daily life, adherence to and satisfaction with personal and community preventive measures, and acceptability of these measures. Handwashing compliance was defined as washing hands with soap and water for a minimum of 20 seconds, after touching surfaces, or having been in a public place. We performed multivariable logistic regression to identify factors associated with non-compliance to handwashing.

In total 1,726 participants responded with a mean age (SD) of 36 (\pm 11) years (range: 12-76 years); most (59%) were male, and lived in apartments (84%). Nearly all participants (99.7%) had heard about COVID-19. Among the 1,726 participants assessed for handwashing compliance, 1,662 (96%) complied; only 64 (3.7%; 95%CI: 2.9-4.7%) were non-compliant. Respondents who stayed in huts/shacks or who were homeless (aOR=6.1, 95%CI: 2.0-18; P=0.002), and those who had not heard about COVID-19 (aOR=13, 95%CI: 2.4-72, P=0.003) were more likely to be non-compliant. Individuals with a high level of satisfaction with handwashing as an appropriate COVID-19 preventive measure were less likely to be non-compliant (aOR=0.26, 95%CI: 0.15-0.45, P<0.001).

The level of compliance to handwashing was very high in the first two months of COVID-19 epidemic in Uganda. Poor housing conditions, low level of awareness about COVID-19, and perceived low level of satisfaction with handwashing as an appropriate COVID-19 preventive measure were associated with non-compliance to handwashing. We recommend continued risk communication and public education especially targeting individuals with poor housing to sustain the high compliance to handwashing. There is need to avail handwashing facilities to individuals with poor housing conditions during the epidemic so as to improve epidemic control.



Introduction

Coronavirus disease 2019 (COVID-19), the respiratory disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) remains a major health threat globally, and has overstretched health systems in many countries. In Uganda, the disease outbreak was first reported on March 21, 2020(1).

The disease may be transmitted from person-to-person through respiratory droplets and contact with infected surfaces. Frequent diligent handwashing with soap and water was recommended as key preventive strategy for COVID-19 in the early phase of the pandemic. Soap breaks down the outer layer of the virus. In addition, the slippery and mechanical motion that arises from handwashing with soap causes the virus to rip off from the skin surface(2). Handwashing has been viewed as an important intervention in the fight against the pandemic for a number of reasons: firstly, soap and water are cheap and readily available; secondly, handwashing is simple to practice by most individuals independently.

Despite the prescribed benefits of proper and frequent handwashing during the pandemic, compliance from individuals across many countries varied owing to the behavioral nature of the intervention(3). Whereas information dissemination and public education are necessary to change behavior, they may not necessarily be sufficient(3). We assessed the level of compliance to handwashing with soap and water, and associated factors, in the first two months of the COVID-19 epidemic in Uganda.

Methods

We abstracted data from the International Citizen Project (ICP), a cross-sectional nationwide online survey that assessed adherence to preventive measures and their impact on the COVID-19 outbreak conducted between 16th and 30th April 2020 using a self-administered questionnaire. The ICP survey collected data on socio-demographic characteristics; the impact of COVID-19 and associated restrictions on daily life, professional life, and personal well-being; adherence to and satisfaction with personal and community preventive measures; and acceptability of these measures. The questionnaire was circulated via WhatsApp, email, Facebook, and Twitter platforms. Individuals who got the questionnaire were asked to disseminate it further, share it with other persons in their networks.

For this study, we abstracted data on socio-demographic characteristics including age, sex, education, location, marital status, housing conditions, and professional life during the COVID-19 lock down. During the survey, frequency of handwashing was assessed using a close-ended question with the frequencies specified as a number per day. Additionally, participants were asked to respond ('yes' or 'no') whether they practiced handwashing after touching surfaces or being in public. Handwashing compliance was defined as, washing hands with soap and water for a minimum of 20 seconds, after touching surfaces, or having been in a public place (4, 5). In addition, we abstracted data on participants' awareness of COVID-19, whether they smoked cigarettes or not, whether they had underlying medical conditions (e.g., diabetes, hypertension, HIV), and their level of satisfaction with the level of handwashing as an appropriate COVID-19 preventive measure. The level of satisfaction with the handwashing as an appropriate COVID-19 preventive measure was assessed using a 5-item Likert scale (1=very dissatisfied to 5=very satisfied). Participants with scores of 1-3 were considered to have low level of satisfaction, while those with scores 4-5 were considered to have high level of satisfaction(6).

Data were extracted and cleaned using MS Excel 2019, thereafter exported to STATA 13 (Statacorp, College Station. Texas) for analysis. Our outcome of interest was compliance to



handwashing with ‘yes’ coded as ‘0’ and ‘no’ coded as ‘1’. We first described participants’ characteristics of the study participants, and compared their distribution among individuals who complied with handwashing and those who did not comply, using Chi-square or two-tailed Fischer’s exact test. We then performed univariable and multivariable logistic regression to identify factors associated with non-compliance to handwashing.

Results

Characteristics of study participants

Overall, 1,726 participants responded with a mean age (SD) of 36 (± 11) years (range: 12-76 years). Most of the participants were male (59%), married/living with partners (58%), and lived in apartments (84%). Nearly all participants had ever heard about COVID-19 (99.7%), and were Ugandans (97%) (Table 1). The distribution of sex ($P=0.030$), nationality ($P=0.011$), housing conditions ($P<0.001$), participants who had ever heard about COVID-19 ($P=0.033$), smoking and level of satisfaction with handwashing as an appropriate COVID-19 preventive measure ($P<0.001$) was statistically significant between participants who did not comply and those who complied with handwashing (Table 1).

Table 1: Characteristics of study participants by hand washing compliance status

Characteristic	Overall (N=1726)	Hand washing compliance		
		No (n=64)	Yes (n=1662)	p value
Age in years, mean(SD)	35.9 (± 10.6)	36.0 (± 10.6)	35.5 (± 9.7)	0.069
Sex, n (%)				0.03
Female	711 (41.2)	18 (28.1)	693 (41.7)	
Male	1015 (58.8)	46 (71.9)	969 (58.3)	
Nationality, n (%)				0.011
Ugandan	1679 (97.3)	59 (92.2)	1620 (97.5)	
Non-Ugandan	47 (2.7)	5 (7.8)	42 (2.5)	
Level of education, n (%)				0.627
University graduate	797 (46.2)	32 (50.0)	765 (46.0)	
Tertiary (Certificate/Diploma)	863 (50.0)	29 (50.0)	863 (50.2)	
Secondary	63 (3.7)	3 (4.7)	60 (3.6)	
Primary	2 (0.1)	0 (0.0)	2 (0.1)	
None	1 (0.1)	0 (0.0)	1 (0.1)	
Marital status, n (%)				0.773
Single	725 (42.0)	28 (43.8)	697 (41.9)	
Married/living with partner	1001 (58.0)	36 (56.3)	965 (58.1)	
Residence, n (%)				0.713
Rural/village	189 (11.0)	8 (12.5)	181 (10.9)	
Kampala City Centre	334 (19.4)	8 (12.5)	326 (19.6)	
Kampala suburb	329 (19.1)	14 (21.9)	315 (19.0)	
Other town center	688 (39.9)	27 (42.2)	661 (39.8)	
Other town suburb	186 (10.8)	7 (10.9)	179 (10.8)	
Housing conditions, n (%)				<0.001
Apartment	1444 (83.7)	46 (71.9)	1398 (84.1)	
Room	259 (15.0)	13 (20.3)	246 (14.8)	
Hut/shack/homeless	23 (1.3)	5 (7.8)	18 (1.1)	



Ever heard about COVID-19 epidemic, n (%)				<0.001
Yes	1720 (99.7)	61 (95.3)	1569 (99.8)	
No	6 (0.4)	3 (4.7)	3 (0.2)	
Occupation, n (%)				0.206
Jobless	124 (7.2)	4 (6.3)	120 (7.2)	
Self-employed	284 (16.5)	13 (20.3)	271 (16.3)	
Student	209 (12.1)	12 (18.8)	197 (11.8)	
Private employed	731 (42.4)	19 (29.7)	712 (42.8)	
Government employed	378 (21.9)	16 (25.0)	362 (21.8)	
Currently smoking, n (%)				0.033
No	1686 (97.7)	60 (93.8)	1626 (97.8)	
Yes	40 (2.3)	4 (6.3)	36 (2.2)	
Underlying medical condition, n (%)				0.528
No	1426 (82.6)	51 (79.7)	1372 (82.7)	
Yes	300 (17.4)	13 (20.3)	287 (17.3)	
Level of satisfaction with hand washing as a preventive measure, n (%)				<0.001
Low	1511 (87.5)	42 (65.6)	1469 (88.4)	
High	215 (12.5)	22 (34.4)	193 (11.6)	

Compliance to handwashing and frequency during the early phase of COVID-19 epidemic in Uganda

Among the 1,726 participants assessed for compliance to handwashing with soap and water, 1662 (96%) complied; the remaining 64 (3.7%; 95%CI: 2.9-4.7%) were not compliant. Of the total 1,726 participants, most washed their hands 6-10 times/day (41%), followed by 3-5 times/day (34%); Only 31 participants (1.8%) did not wash their hands at all; 30 participants (1.7%) washed their hands more than 30 times/day (Figure 1).

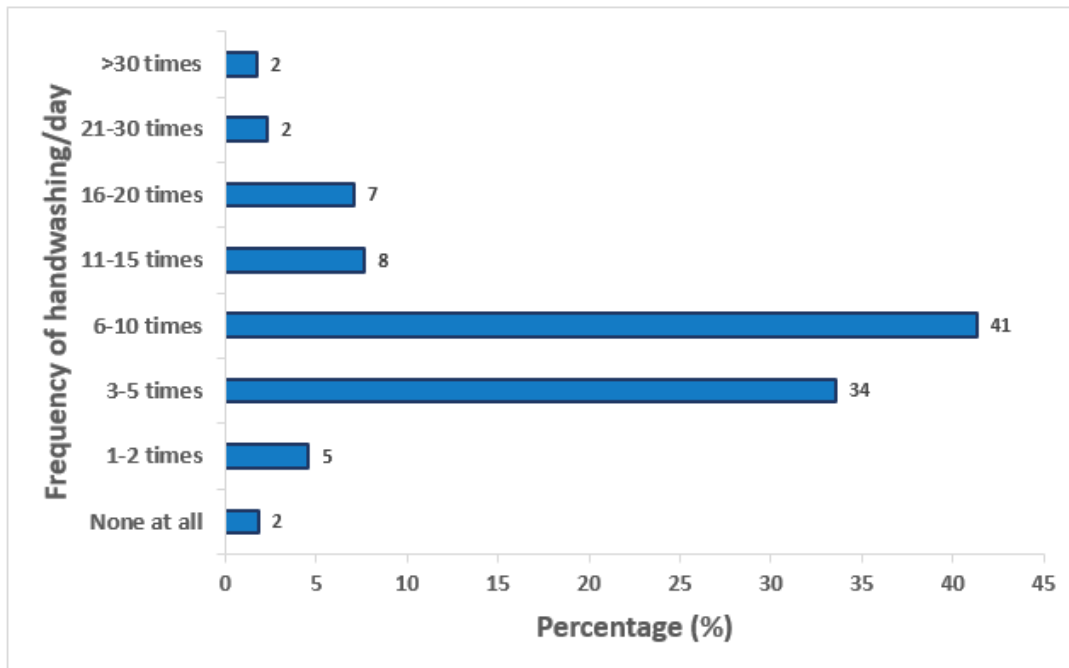


Figure 1: Percentage prevalence of handwashing by number of times of handwashing per day among 1,726 participants assessed for handwashing compliance in the early phase of COVID-19 outbreak, April 17-13, 2020



Factors associated with non-compliance to handwashing during the early phase of COVID-19 epidemic in Uganda

In multivariable analysis, individuals who had significantly higher odds of non-compliance were those who stayed in huts/shacks or who were homeless (aOR=6.1, 95% CI: 2.0-18; $P=0.002$) and individuals who had not heard of COVID-19 (aOR=13, 95% CI: 2.4-72, $P=0.003$). Individuals with high level of satisfaction with handwashing as an appropriate COVID-19 preventive measure were less likely to be non-compliant to handwashing (aOR=0.26, 95% CI: 0.15-0.45, $P<0.001$).

Discussion

We assessed the level of compliance to handwashing with soap and water and associated factors in the first two months of the COVID-19 outbreak in Uganda. Nearly all (96%) of the respondents were compliant to handwashing; poor housing conditions (being homeless, or staying in huts/shacks) and not being aware of COVID-19 were associated with non-compliance. Respondents who were highly satisfied with handwashing as an appropriate COVID-19 prevention measure were less likely to be non-compliant.

A recent demographic and health survey in Uganda, prior to the COVID-19 pandemic, reported handwashing compliance of 44% among household members whose households had soap and water available(7). The high level of compliance to handwashing with soap and water observed in this study emphasizes the fact that COVID-19 could have reinforced handwashing behavior(8). This may be attributed to the extensive messaging on different media platforms, emphasizing the importance of handwashing in the pandemic. Consistent with our findings, a study among Polish adolescents also reported a significant improvement in handwashing compliance with soap and water during the COVID-19 pandemic(9). Sustaining the high level of compliance to handwashing in Uganda will require sustained health promotion efforts aimed at improving hygiene, through mass media and social media in the different phases of the epidemic and in the post-COVID-19 era.

Our findings demonstrated that individuals who were homeless or staying in poor housing conditions were more likely to be non-compliant to handwashing with soap and water. Poor housing conditions is an indicator of poor socioeconomic status which is often coupled with water insecurity; under these circumstances of water scarcity, the scarce water is prioritized for other domestic needs such as cooking(10). The water insecurity most common in poor housing conditions in low-income countries may undermine the COVID-19 response efforts in the developing countries, and make water-insecure areas (e.g., slums) epicenters for disease transmission(10). We therefore recommend that designated handwashing points be availed in areas with poor housing conditions so that handwashing with soap and water is more easily accessible to all Ugandans given the wide health benefits of handwashing.

Our study revealed that respondents who had never heard about COVID-19 were more likely to be non-compliant to handwashing with soap and water. Persons unaware of a disease always have low knowledge levels about the disease; the low knowledge ultimately influences the perception of disease severity. According to the Health Belief Model (HBM), persons with perceived severity and susceptibility of being afflicted with life-threatening diseases including COVID-19 are more likely to practice personal preventive measures such as handwashing and facemasks use(11). Although awareness about COVID-19 was nearly universal among our study



population, the fact that respondents who were not aware about the disease were less likely to practice handwashing, calls for the need to continue sensitization and risk communication among Ugandans. Similarly, respondents who were not highly satisfied with handwashing as an appropriate COVID19 preventive measure were less likely to be compliant. This is consistent with previous findings from research about the influence of perception of social campaigns by the general public on individual preventive measures(12). It is believed that the attitude towards public health measures practiced in a given society may influence one's behavior and readiness to accept such interventions(12).

Although our study generated valuable nationwide data on handwashing frequency and adherence to handwashing with soap and water by the Ugandan population, it is important to mention the study limitations. First, the study relied on self-report of handwashing behavior, making it susceptible to social-desirability bias. However, this was minimized by making the questionnaire self-administered. Second, data were collected online via internet; individuals who had no access to internet connection were unable to participate in our study. Therefore, our study sample is not a good representation of the general population in Uganda, and may have overestimated the prevalence of handwashing compliance.

Conclusions and recommendations

The level of compliance to handwashing with soap and water was much higher in the Ugandan population in the first two months of COVID-19 epidemic, compared to 'normal times'. Poor housing conditions, low level of awareness about COVID-19, and perceived level of satisfaction with handwashing by the public were associated with non-compliance to handwashing. We recommend continued risk communication and public education to sustain the high compliance to handwashing. There is need to avail designated handwashing points to individuals with poor housing conditions during the epidemic so as to improve epidemic control.

Disclaimer

The contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of the Makerere University School of Public Health, the Ministry of Health Uganda, and Global Health Institute, University of Antwerp.



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