

## Effects of Coronavirus Pandemic on Young Adults' Ability to Access Health Services and Practice Recommended Preventive Measures

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### Abstract

Given the limited attention to young adults as key contributors to the spread of COVID-19 in Uganda, this study examines the effects of the outbreak on the ability of young adults aged 18-29 to access health services and practice preventive measures. A national population-based mobile phone survey was conducted in December 2020. Multivariable regression analyses were used to explore the effect of the COVID-19 pandemic on access to health care services. Control variables included region, education level, parity, and source of health information. The majority (98%) perceived COVID-19 as a serious threat to Ugandans. Although the majority reported handwashing (97%) and masking (92%), fewer respondents avoided shaking hands (39%), ensured physical distancing (57%), avoided groups of more than four people (43%), stayed home most days (30%), avoided touching eyes, nose, and mouth (14%), and practiced sneezing/coughing into their elbow (7%). Participants noted that the COVID-19 pandemic affected their ability to access family planning (40%), HIV (49%), maternal health (55%), child health (56%), and malaria (63%) services. The perceived effect of the COVID-19 pandemic on services was higher for those in the Northern region (OR= 2.00, 95% CI 1.00-4.02), those with higher education OR= 2.26, 95% CI 1.28-3.99), those with five plus children (OR= 2.05, 95% CI 0.92-4.56), and those who trust radio for COVID-19 information (OR= 1.65, 95% CI 1.01-2.67). The findings show the pragmatic importance of understanding the dynamic characteristics and behavioral patterns of young adults in the context of COVID-19 to inform targeted programming.

**Keywords:** Coronavirus, COVID-19, behavior, health services, social behavior change, sub-Saharan Africa, Uganda, young adults

### 1. Introduction

Coronavirus disease 2019 (COVID-19) is an infectious and transmissible disease that spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes (WHO, 2021; Shereen, Khan, Kazmi, Bashir, & Siddique, 2020). COVID-19 was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020, and Uganda declared its first case on March 21, 2020 (Feyisa 2021; WHO 2020; Orgilés, Morales, Delvecchio, Mazzeschi, & Espada, 2020; Oosterhoff, Palmer, Wilson, & Shook, 2020). The WHO declaration brought with it global panic, fear of contracting the disease, and the disruption of social life. As part of the measures to curb the spread of the pandemic, stringent government restrictions were instituted, including a total lockdown from March 30, 2020, to June 22, 2020, closure of schools and business centers such as markets, arcades, bars, hotels, sports grounds, prohibition of gatherings of 10 or more people, country-wide travel prohibition, closure of cross border travels except cargo transportation, closure of public transport, a 14-day quarantine of returning travelers, and curfew running from 19:00 to 06:30 hours (Matovu, Kabwama, Ssekamatte, Ssenkusu, & Wanyenze, 2021; Linnemayr et al., 2020). Moreover, the government also promoted infection prevention measures such as washing hands often with soap and water for at least 20 seconds, use of hand sanitizers, and avoiding touching eyes, nose, and mouth with unwashed hands (Bukuluki, Mwenyango, Katongole, Sidhva, & Palattiyil, 2020). The widespread social and economic effects of the COVID-19 pandemic in

Uganda have likely affected access to, and perceptions of, health care services. This could partly be linked to the stringent restrictions that came with the pandemic.

As cases of COVID-19 continue to soar, with 51,006 confirmed cases and 374 deaths in the country by June 5, 2021 (MOH, 2021), there is still limited attention on young adults as key contributors to the spread of the pandemic in Uganda, and notably, how the pandemic has affected their access to health services and practice of prevention measures.

Young adults in Uganda typically encounter barriers to accessing health services including family planning (Adams, Salazar, & Lundgren, 2013), HIV testing, and treatment (Small, Nikolova, Zhou, & Okumu, 2021; MacCarthy et al., 2018). As Nagata (2020) notes, young adults are generally assumed to be healthy, yet they may be a key population to turn the tide of COVID-19 transmission, because of their low risk perception. Although there is data on COVID-19 cases, the public is not regularly updated on age specific persons found to be positive in Uganda. Disaggregation of data may in one way affect the risk perception of certain groups of the population including young adults. The young adults are a potentially vulnerable population and need to be uniquely supported to adhere to public health guidance to prevent the spread of the pandemic and to access health services.

The present study examines how the COVID-19 pandemic has affected the ability to access health services and practice of preventive measures among young adults aged 18-29 in Uganda. Specifically, we explore young adults' perceived threat of COVID-19, measures taken to control the spread of the pandemic, the perceived effect of the COVID-19 pandemic on their ability to access health care services, and their exposure to COVID-19 messages, including the messages seen or heard and sources of health information. The study provides insights that inform the targeted design and implementation of health promotion including social and behavior change interventions aimed at curbing the spread of the pandemic among this priority audience and beyond.

## **2. Methods**

### *2.1 Study Design*

A cross-sectional population-based mobile phone survey was conducted in December 2020 due to restrictions on in-person data collection during the COVID-19 pandemic. The survey covered the four regions of Uganda including Central, Eastern, Northern, and Western.

### *2.2 Study Participants and Sampling Procedure*

The survey collected data from women and men aged 18–49 using Computer Assisted Telephone Interviewing (CATI) techniques. This study focuses on only the subsample of young adults aged 18-29. The sample size calculation assumed a prevalence of .50 (for maximum variability across multiple health behaviors), .80 power, 0.05 alpha, 0.075 delta, and a design effect of 1.5. Based on these parameters, a total sample of 1400 individuals were recruited, and evenly distributed among men and women. A two-stage sampling approach was used. Within each region, we randomly selected households with probability proportional to population size of the enumeration areas (EAs), using the most recent 2016 census sampling frame obtained from the Uganda Bureau of Statistics. Then, a team of trained researchers worked with community leaders, including local council chairpersons (LC1s) and village health teams (VHTs), to collect household-level data on cell phone ownership. For each identified household with a cell phone, the contact number, gender, age, and preferred language of the cell phone owner were noted. The information was used to generate a sampling frame of representative phone numbers across the four regions that were used for the interviews. The inclusion criteria for the study participants were: women and men aged 18–49 years, residents in one of the four regions of Uganda, with ability to communicate effectively in the local language or English, provide informed consent, and access a mobile phone either personally or through someone in the household. The eligible participants were systematically contacted and recruited into the study. From each EA, 8 households were randomly selected and an adult member of the household was interviewed. This manuscript focuses on data from the 432 young adults aged 18-29 who were interviewed.

### *2.3 Study Variables or Measures*

For socio-demographics, the survey assessed age based on self-reported age in years at the time of the survey (subsequently dichotomized into 18-24 versus 25-29 in order to compare younger and older cohorts of the young adult subsample), sex (male versus female), education level (less than primary schooling, primary or some secondary schooling, completed secondary school or higher), region (Central, Eastern, Northern, or Western), residence (rural or urban), and number of children under participants' care (subsequently categorized as none, one to four, and five or more). The participants' perceived threat of COVID-19 was assessed using the question: do you

agree or disagree that COVID-19 poses a real threat to Ugandans? Responses were on a 3-point Likert scale of agree, neither agree nor disagree, and disagree. The extent to which COVID-19 affected access to health care services was assessed with the following question: to what extent has the pandemic affected your ability to access [*name health service*] in your area. The question was repeated for each type of health service of interest: family planning, HIV, maternal health, child health, and malaria. Responses were on a 3-point Likert scale of not at all, to some extent, and to a great extent. Participants also were asked if they took any action to avoid the spread of COVID-19 (yes versus no) and then were asked which specific measures were taken to curb the spread of the pandemic. Measures included hand washing; masking; social distancing; avoiding hand shaking; avoiding touching eyes, nose, and mouth; staying home; and sneezing or coughing inside of the elbow. Participants also were asked if they had seen or heard any message on COVID-19 (yes versus no), what specific messages they recalled and how many times they recalled seeing or hearing the specific messages (1, 2, or 3 or more times). Finally, participants were asked about their preferred or trusted sources of health information (responses included social media, television, radio, newspapers, health worker, community leaders, or other sources).

#### 2.4 Ethical Approval

Ethical approval for the study was obtained from the Johns Hopkins School of Public Health Institutional Review Board in the United States of America, under reference 13837, and in Uganda from the Makerere School of Public Health Higher Degrees, Research and Ethics Committee, under reference 864. The study was also registered with the Uganda National Council of Science and Technology. Verbal informed consent was sought from each participant before the interviews were undertaken and documented by study staff.

#### 2.5 Data Analysis

Analyses were carried out using Stata 14 and SPSS 25. Tests of association (Chi-square) explored participants' characteristics and outcomes of interest. Multivariable regression analyses were used to explore the effect of COVID-19 pandemic on access to health care services by young adults aged 18-29. Covariates in the model included region, education level, parity, and source of health information. We assessed the model to be a good fit using Hosmer and Lemeshow's goodness-of-fit test at  $p > 0.1$ .

### 3. Results

#### 3.1 Socio-Demographics

Our analysis included a total of 432 young adults aged 18-29 years. Of these, 47% were male and 53% female. The majority (60%) were in the age group of 25-29. Thirty percent of the participants were from Eastern region, and 71% from rural residence. Forty-one percent had primary or some secondary schooling, 33% had completed secondary school or higher education, and 26% had less than primary schooling. Overall, 72% had one to four children under their care. Notably, more participants aged 25-29 (77%) reported having one to four children under their care (Table 1).

Table 1. Socio-demographics characteristics of participants

Measure	Age group		Total	P
	18-24	25-29	N = 432 (100%)	
	N = 171 (40%)	N = 261 (60%)		
<i>Gender</i>				
Male	42%	50%	47%	0.100
Female	58%	50%	53%	
<i>Region</i>				
Central	19%	25%	23%	0.002
Eastern	40%	23%	30%	
Northern	23%	26%	25%	
Western	17%	26%	22%	

<i>Residence</i>				
Urban	29%	30%	29%	0.850
Rural	71%	70%	71%	
<i>Education level</i>				
Less than Primary schooling	25%	26%	26%	0.033
Primary or some secondary schooling	48%	37%	41%	
Completed secondary school or higher	27%	37%	33%	
<i>Number of children under their care</i>				
None	28%	11%	18%	<0.001
One – four	64%	77%	72%	
Five or more (5+)	8%	12%	10%	

### 3.2. Perceived Threat of COVID-19 and Measures Taken to Control the Spread of the Pandemic

#### 3.2.1 Perceived Threat of COVID-19

Overall, 98% of the participants perceived COVID-19 as a real threat to Ugandans. Table 2 indicates that young adults aged 18-24 were slightly less likely to perceive COVID-19 as a real threat to Ugandans compared to adults aged 25-29 years, particularly in Central and Western regions.

#### 3.2.2 Measures Taken to Control the Spread of COVID-19

Overall, 99% of the participants reported that they took at least one action to control the spread of COVID-19 in the past six months preceding the survey. Table 2 shows that the majority across age groups reported that they had cleaned hands with soap/sanitizer more often, 96% for 18-24 years, and 97% for 25-29%. Similarly, the majority indicated that they always wear a face mask when outside, 93% for 18-24 years, 91% for 25-29 years. However, overall, the actions on avoiding shaking hands/hugging people (39%), practicing social distancing (57%), avoiding groups of more than 4 people (43%), and staying home most days and only moving outside if necessary (30%), were low across all age groups. Similarly, the actions on avoiding touching soft parts of the body such as eyes/nose/mouth (14%), sneezing/coughing in the inside of the elbow (7%), and staying at or camping at the workplace if necessary (4%) were very low.

By age group, the actions of avoiding shaking hands/hugging people (38%), avoiding touching soft parts of the body such as eyes/nose/mouth (11%), staying home most days and only moving outside if necessary (28%), and sneezing/coughing in the inside of the elbow (5%), and staying at or camping at the workplace if necessary (5%) were low for those aged 18-24. Avoiding touching soft parts of the body such as eyes/nose/mouth (15%) sneezing/coughing in the inside of the elbow (8%), and staying at or camping at the workplace if necessary (3%) were low for those aged 25-29 years (Table 2).

Table 2. Measures taken to control the spread of COVID-19

Measure	Age group		Total N = 432 (100%)	P
	18-24 N = 171 (40%)	25-29 N = 261 (60%)		
<i>Perceived COVID-19 threat as a real threat to Ugandans</i>				
Central	94%	98%	97%	0.266
Eastern	97%	98%	98%	1.000
Northern	98%	97%	97%	1.000
Western	93%	100%	98%	0.089
<i>Took any action to avoid/curb the spread or contracting Corona virus in the past six months</i>				
Yes	99%	99%	99%	1.000
<i>Measures taken to control the spread of COVID-19</i>				
Clean hands with soap/sanitizer more often	96%	97%	97%	0.799
Wear a face mask when outside and all the time	93%	91%	92%	0.594
Avoid shaking hands/hugging people	38%	40%	39%	0.730
Practice social distancing (Keep 2m/6ft a part)	55%	58%	57%	0.579
Avoid groups of more than 4 people (>4)	42%	44%	43%	0.657
Avoid touching soft parts of the body such as eyes/nose/mouth	11%	15%	14%	0.253
Stay home most days and only move outside if necessarily	28%	31%	30%	0.429
Sneeze/cough in the inside of the elbow	5%	8%	7%	0.171
Stay at or camp at the workplace if necessary	5%	3%	4%	0.165

### 3.3 Factors Associated with the Effect of COVID-19 Pandemic on Access to Health Care Services

Overall, the participants indicated that COVID-19 affected their ability to access health services including family planning (40%), HIV (49%), maternal health (55%), child health (56%), and malaria (63%). Table 3 shows that the odds of reporting that COVID-19 greatly affected their ability to access family planning were higher for those who trusted radio as a source of information (OR= 1.65, 95% CI 1.01 - 2.67). The odds of reporting the same for HIV care and support services were higher for those in the Northern region (OR= 1.76, 95% CI 0.96-3.23). Similarly, the odds of reporting that COVID-19 greatly affected their ability to access HIV care and support services were higher for those who had primary or some secondary schooling (OR= 1.98, 95% CI 1.17 - 3.35) and those who completed secondary (OR= 2.26, 95% CI 1.28 - 3.99). The odds of reporting the same for maternal health services were higher for those who had 5 or more children (OR= 2.05, 95% CI 0.92 - 4.56). Similarly, the odds of reporting that COVID-19 greatly affected their ability to access child health services were higher for those in the Northern region (OR= 1.79, 95% CI 0.90 - 3.58) and those who trusted radio as their source of information (OR= 1.67, 95% CI 1.03 - 2.70). The odds of reporting the same for malaria services were higher for those in the Northern region (OR= 2.00, 95% CI 1.00 - 4.02) as indicated in Table 3.

Table 3. Factors associated with the effect of COVID-19 pandemic on access to health services

Predictor	Perceived effect of COVID-19 on Health Services				
	Family Planning	HIV	Maternal Health	Child Health	Malaria
<b>Age group</b>					
25-29 (ref)	1.00		1.00	1.00	
18-24	1.16 (0.76 – 1.76)		1.18 (0.77 - 1.80)	1.30 (0.85 - 1.99)	
<b>Gender</b>					
Male (ref)	1.00	1.00	1.00		1.00
Female	0.73 (0.49 – 1.10)	0.71 (0.47 – 1.07)	0.74 (0.49 - 1.10)		0.80 (0.53 - 1.20)
<b>Region</b>					
Central (ref)	1.00	1.00	1.00	1.00	1.00
Eastern	0.62 (0.34 – 1.14)	0.57** (0.32 - 1.00)	0.84 (0.46 - 1.52)	0.77 (0.41 - 1.48)	1.55 (0.81 - 2.97)
Northern	1.33 (0.72 – 2.44)	1.76* (0.96 - 3.23)	1.65 (0.88 - 3.09)	1.79* (0.90 - 3.58)	2.00* (1.00 - 4.02)
Western	1.27 (0.69 – 2.35)	1.26 (0.68 - 2.32)	1.39 (0.75 - 2.56)	0.94 (0.50 - 1.79)	1.52 (0.79 - 2.92)
<b>Education level</b>					
Less than primary (ref)		1.00			1.00
Primary or some secondary schooling		1.98** (1.17 - 3.35)			0.91 (0.54 - 1.53)
Completed secondary or higher		2.26*** (1.28 - 3.99)			1.43 (0.80 - 2.53)
<b>Parity (number of children under one's care)</b>					
No children (ref)			1.00	1.00	
1-4 children			1.48 (0.86 - 2.56)	1.47 (0.84 - 2.56)	
5 or more children			2.05* (0.92 - 4.56)	1.04 (0.47 - 2.30)	

Trusted source of information				
<b>Not trusted</b>	1.00	1.00	1.00	1.00
Radio	1.65** (1.01 - 2.67)	1.48 (0.92 - 2.38)	1.67** (1.03 - 2.70)	1.50 (0.91 - 2.47)
TV	0.68 (0.43 - 1.09)			1.49 (0.87 - 2.54)
Health worker		0.70 (0.45 - 1.08)		

Note. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1, aOR = adjusted Odds Ratio, CI = Confidence Interval.

### 3.4 Exposure to COVID-19 Messages and Sources of Information

#### 3.4.1 Participants Who Had Seen or Heard Messages on COVID-19

Overall, 99% of the participants had seen or heard a message on COVID-19 in the past six months preceding the survey. Table 4 indicates that 97% had seen or heard the COVID-19 messages several times [3 or more times]. The majority had seen or heard a message on frequently washing hands with soap and running water for at least 20 seconds (88%), maintaining a 2-meter distance from everyone especially when one leaves home (82%), always wearing a mask when going to public places (73%), and avoiding crowded places (60%). However, smaller proportions had seen or heard a message on avoiding shaking hands or hugging people (42%), avoiding touching eyes, mouth, nose, and ears (26%), and not stigmatizing people who have recovered from COVID (2%). By age group, about one-quarter among 18-24 (26%) and 25-29 (26%) year old participants had seen or heard a message on avoiding touching eyes, mouth, and nose, but only 1% and 3% respectively indicated the same for not stigmatizing people who have recovered from COVID-19.

#### 3.4.2 Sources of COVID-19 Information

Most participants had heard COVID-19 messages on radio (90%), while fewer proportions had heard or seen messages on TV (46%), newspapers (8%), telephone messages (48%), print materials such as brochures (5%), and social networking sites including Facebook, Twitter (10%) as indicated in Table 4. The majority (71%) reported that radio is their most trusted source of health information followed by health workers (66%), with social media (10%) and newspapers (5%) being the least trusted.

Additionally, the majority (72%) reported that they listen to radio every day and 16% do so a few times a week. Twenty-eight percent indicated that they watch TV every day, and 18% do so a few times a week. Similarly, 14% check the internet every day, and 11% do so a few times a week.

Table 4. Exposure to COVID-19 messages and sources of health information

Measure	Age group		Total N = 432 (100%)	P
	18-24 N = 171 (40%)	25-29 N = 261 (60%)		
<i>Times they recall seeing or hearing the Corona virus messages</i>				
Once	1%	1%	1%	0.532
Twice	3%	2%	2%	
Several times [3 or more times]	96%	97%	97%	

<i>COVID-19 messages seen or heard</i>				
Maintain a 2-meter distance from everyone especially when you leave home	81%	82%	82%	0.680
Frequently wash your hands with soap and running water for at least 20 seconds	89%	87%	88%	0.422
Use an alcohol-based hand sanitizer	48%	55%	52%	0.156
Do not shake hands or hug anyone	46%	40%	42%	0.155
Avoid touching your eyes, mouth, nose, and ears	26%	26%	26%	0.944
Avoid crowded places	58%	62%	60%	0.411
Always wear a mask when going to public places	66%	78%	73%	0.006
Don't stigmatize people who have recovered from COVID-19	1%	3%	2%	0.094
<i>Where the COVID-19 messages were seen or heard</i>				
Television	49%	44%	46%	0.404
Radio	92%	89%	90%	0.229
Newspapers	6%	10%	8%	0.130
Websites	1%	2%	2%	0.708
Mobile and telephone	40%	52%	48%	0.017
Hard copy printed materials include brochures such as information, education and communication materials.	2%	7%	5%	0.035
Social networking sites include Facebook, LinkedIn, GooglePlus	7%	12%	10%	0.078
Community and Microblogging includes Twitter, YouTube, TikTok, Vimeo	2%	4%	3%	0.392
Messaging platforms include WhatsApp and WeChat	4%	7%	6%	0.133
<i>Trusted source of health information</i>				
Social media (Facebook, WhatsApp, Twitter)	9%	10%	10%	0.589
Television	30%	29%	29%	0.808
Radio	71%	71%	71%	0.986
Newspapers	4%	6%	5%	0.290
Health worker	63%	67%	66%	0.405
Community leader	25%	24%	25%	0.812

#### 4. Discussion

This study aimed at obtaining a deeper understanding of the effect of the COVID-19 pandemic on the ability to access health services and practice of preventive behaviors among young adults, specifically focusing on the perceived risk of COVID-19, measures taken to control the spread of the pandemic, the associated effects of the pandemic on access to health services, exposure to COVID-19 messages, and sources of information. The prevailing perception that the COVID-19 pandemic significantly influenced access to health services among young adults in Uganda could partly be explained by the government restrictions, some of which are still in effect, such as curfew from 21:00 to 05:30 hours, closure of schools and churches, prohibition of large gatherings, and closure of business centers such as bars, discos, cinemas. Additionally, young adults' access to services during the COVID-19 pandemic may also be influenced by structural and logistical factors. Studies found that the associated effects of the COVID-19 pandemic on access to health care services are related to lack of or insufficient money for transportation, police violence while enforcing the lockdown poses restrictions on clients' travel to health facilities for services, perceived low quality of services resulting in stock outages and self-medication, and perceptions of potential risks of exposure to COVID-19 while travelling to and/or at the health facility (Linnemayr et al., 2020; Dyer et al., 2020; Sherrard-Smith et al., 2020; Lindberg, Bell, & Kantor, 2020). These factors could partly explain the finding in the present study.



In this study, the majority of young adults perceived COVID-19 as a threat to Ugandans, consistent with the U-LEARN (2020) study. From our study, almost all young adults claimed that they took at least one action to control the spread of COVID-19 including hand washing and wearing face masks, but fewer young adults reported avoiding hand shaking, social distancing, avoiding groups of more than 4 people, avoiding touching eyes, nose and mouth, and sneezing inside the elbow. This finding is consistent with other studies which found that relatively fewer young adults practiced physical distancing (Feyisa, 2021; Varol et al., 2021; Babalola et al., 2020). These findings point to the need to strengthen health education interventions including working with youth champions to promote personal responsibility in the uptake of the recommended preventive measures. Our findings further indicate that the reluctance of young adults to practice the COVID-19 prevention measures is linked to the low COVID-19 risk perception for their age group, low education levels, and limited access to information on COVID-19. Similarly, other studies point to the low income levels, community paying less attention to the disease, and limited exposure to information on how to practice the preventive measures in the youths' settings (Matovu et al., 2021; Olum, Chekwech, Wekha, Nassozi, & Bongomin, 2020; Abdelhafiz et al., 2020). With the current rising cases of COVID-19 among young adults in Uganda, our findings point to the need to intensify risk communication by putting a face to COVID-19 such as showing live examples of COVID-19 patients in hospital, using testimonies of recovered COVID-19 patients, and showing the economic burden caused by the pandemic. Our study also found that females were more likely to practice the recommended measures to control the spread of the pandemic than males, a finding which is consistent with that of Zhong et al., (2020) and Ningsih, Eka, & Danal, (2021). Thus, working with youth female positive deviants as champions to the cause of promoting the practice of preventive measures is vital.

Furthermore, our study found that almost all participants had seen or heard messages on COVID-19 several times. Radio was the most common and trusted source of COVID-19 information among young adults, followed by health workers. Mobile and telephone were slightly below average as a source of information. However, newspapers, messaging platforms, and social media were the least trusted sources of information. These findings are consistent with other studies where radio, health workers, and TV are preferred sources of information (Usman et al., 2020). However, the limited internet connectivity in many parts of Uganda and sub-Saharan Africa poses a challenge to the consistent use of phones and social media to access information by the populace. Therefore, it is imperative to address the internet connectivity challenges to harness the opportunities presented by the constantly growing electronic or digital technologies.

#### *4.1 Implications for Programming*

Our findings point to the need to strengthen targeted health promotion interventions that motivate young adults to practice the recommended preventive measures to curb the spread of the pandemic and improve their ability to access health services. Health promotion and education messages should be intensified using multiple channels of communication to increase risk perceptions among young adults, and promote the practice of COVID-19 prevention measures. It is imperative to use the most common and trusted sources of information—in this case, radio and health workers—to reach young adults with COVID-19 information. Also, programs should explore or leverage new opportunities presented by evolving technologies, including promoting the use of social media platforms to share health information across age groups. Qualitative research should be done to get deeper insights into the factors that affect young adults' ability to access health services in the midst of the pandemic. It is also important to understand better the challenges that young adults face in accessing health information and specific health services, and what hinders them from practicing the recommended COVID-19 preventive measures. Additionally, intensifying advocacy efforts and allocating funding to develop interventions that foster community engagement in developing contextual and practical solutions that address the barriers to accessing health service are imperative. The advocacy efforts should collaboratively engage policymakers, community leaders, parents, and health workers to strengthen community response to the pandemic. More so, targeted efforts should be made to address the barriers occurring at the structural, social, economic, and environmental levels—such as the impact of curfew laws—that make it difficult for young adults to practice the recommended prevention measures and access health services.

#### *4.2 Study Limitations*

This study had some limitations. Behaviors were self-reported which made over-or under-reporting of certain health behaviors more likely due to social desirability and recall bias. Nonetheless, the self-reported data provided practical insights into areas for strengthening in programming. The study also relied on a mobile phone survey approach which has limitations where some subgroups of the population have limited access to mobile phone technologies. Since the study required access to a mobile phone, it may not accurately represent vulnerable groups such as youth, with lower phone access.

## 5. Conclusion

Young adults are key contributors to the spread of COVID-19; thus, they need to be uniquely supported to access health services and adhere to the public health prevention guidelines. The majority of participants in our study indicated that COVID-19 has affected their access to health services. This shows the pragmatic importance of understanding the dynamic characteristics and behavioral patterns of young adults in the context of COVID-19 to inform targeted programming. Our findings also indicate that although the majority claimed that they took at least one action to prevent the spread of COVID-19, fewer participants avoided shaking hands, ensured physical distancing, avoided groups of more than 4 people, stayed home most of the days, avoided touching eyes, nose, and mouth, and sneezing/coughing in the inside of the elbow. The findings show the need to intensify health promotion as well as social and behavior change interventions alongside structural interventions that address challenges to the access of health services and promote the practice of preventive measures.

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## Competing Interests Statement

The authors declare that there are no competing conflicts of interest.

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