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ORIGINAL ARTICLE

Awareness, perception and the practice of COVID-19 prevention among residents of a state in the South-South region of Nigeria: implications for public health control efforts

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Background: As with any epidemic, coronavirus disease 2019 (COVID-19) has evoked panic, fear and misconceptions. The risk communication pillar of the Public Health Emergency Operations Centre is responding to the pandemic by facilitating correct and consistent information to enable the adoption of behaviours to prevent and control COVID-19. This study explored awareness, perception and practice of COVID-19 prevention among residents in Rivers State, Nigeria, during the early stages of the COVID-19 pandemic response.

Methods: This was a descriptive cross-sectional survey among 1294 adult residents across all districts of the state. It employed an interviewer-administered questionnaire. Knowledge was graded as excellent for scores of ≥80%, good for scores of 50–79% and poor for scores of <50%. Respondents who washed all critical parts of their hands were categorised as adopting correct handwashing practice. Regression modelling was employed to determine predictors of knowledge and practice of COVID-19 prevention with p=0.05.

Results: The respondents were aged 18–80 y with an average age of 39.6 (SD=11.9) y. A total of 710 (54.9%) were male, 476 (36.8%) were unemployed with 685 (52.9%) having secondary education. The most common sources of information about COVID-19 were radio jingles (1102; 86.7%) and television adverts (940; 74.0%). Overall, 608 (47.0%) of the respondents had a poor knowledge of COVID-19. About 443 (34.9%) respondents believed they were unlikely to contract the virus. Only 505 (39.0%) of respondents washed all the critical parts of their hands correctly. Occupation (adjusted OR [AOR]=1.39, 95% CI 1.07 to 1.82, p=0.01), level of education (AOR=4.71, 95% CI 1.90 to 11.68, p<0.001) and location (AOR=1.75, 95% CI 1.29 to 2.38; p<0.001) significantly predicted respondents' knowledge about COVID-19. The significant predictors of practice of COVID-19 were age (AOR=0.60, 95% CI 0.42 to 0.84, p=0.003), occupation (AOR=1.93, 95% CI 1.41 to 2.63, p<0.001), location (AOR=2.35, 95% CI 1.65 to 3.34, p<0.001) and knowledge about COVID-19 (AOR=7.75, 95% CI 5.94 to 10.11, p<0.001).

Conclusions: Broadcast media has a pivotal role to play in risk communication for behavioural change for the control of current and future epidemics in this population.

Keywords: attitude, COVID-19 prevention, knowledge, practice, public health control.

Introduction

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported in Wuhan, China, in 2019.[1] The disease spread quickly in epic proportions to over 26 countries within 8 wk, prompting the WHO to declare it a pandemic on 11 March 2020.[2] The pandemic has taken its toll on virtually every country in the world, including Nigeria, which recorded its first case in February 2020 and has since gone on to record over 50 000 cases (as of 18 August 2020).[3] Rivers State is in the South-South region and is a major economic area known for crude oil exploration; the region had experienced close to over 2000 cases (as of 18 August 2020) following its index case identified on 25 March 2020. Rivers State is ranked fifth among the high burden states in Nigeria.[4]

As with any epidemic of an infectious nature, panic, fear and misconceptions are rife. This is more so with COVID-19, because at the time the current study was conducted there was no vaccine or specific cure for the disease.[1] Coronavirus disease is known to be highly infectious but with a low national case fatality rate of 2.1% compared with other epidemic diseases that have impacted the country, like Ebola virus (42.1%) and Lassa fever (20.9%).[5] A similar picture of misinformation, poor knowledge regarding the disease outbreak and negative behaviours was observed during the Ebola epidemic of 2014, which led to a lot of harmful practices being carried out by people attempting to remain safe.[6,7] A study performed in China in the early stages of the pandemic showed good knowledge and practice of preventive measures against COVID-19, with 98% of respondents wearing a face mask when going out.[8] However, in Nigeria, while most people identified radio as their main source of information on COVID-19, they attributed the disease to one affecting only the affluent and could not be bothered with practising preventive measures in the face of economic hardship during the lockdown.[9,10]

The risk communication pillar of the Public Health Emergency Operations Centre (PHEOC) is responding to the pandemic through multifaceted activities relating to community mobilisation, mass media, training of message multipliers, information education and communication materials. These activities are geared towards facilitating correct and consistent information from experts to communities at risk to enable them to adopt behaviours to prevent and control COVID-19.[11] The efforts at flattening the pandemic curve in the South-South region will ultimately depend on the willingness of people to adopt and maintain public health preventive health practices as advocated during community engagements.

It is therefore critical that a risk assessment is carried out to explore the awareness, perception and practising of COVID-19 prevention among residents of communities in Rivers State. In addition, determination of the predictors of the practice of COVID-19 prevention would inform risk communication activities to facilitate desirable behavioural change for COVID-19 prevention.

Methods

This was a descriptive cross-sectional survey that took place among community residents in all 23 local government areas (LGAs) of Rivers State during 18 May–10 June 2020. Data were collected by disease surveillance and notifications officers (DSNOs) who are familiar with the terrain in each LGA and are trained in data-collection techniques. A sample size of 1186 adult respondents was calculated based on the sample size formula for single proportions, where the prevalence of good knowledge about COVID-19 was set at 50% (because there is no previously established prevalence), degree of accuracy was set at 3% (95% CI) with a 10% non-response rate.

The data collection tool was an interviewer-administered four-page questionnaire built into the Open Data Kit (Get ODK Inc. San Diego, California) application for android phones with GPS tracking. Training was carried out for the DSNOs on the objectives and tools for the study. Data were exported to Microsoft Excel and analysed with SPSS version 23.

The major outcome variables studied were knowledge of COVID-19, attitude towards COVID-19 and practice of COVID-19 prevention methods. The knowledge score was computed by scoring every correct answer to the knowledge questions as 1 and every wrong answer as 0. The total knowledge score was computed, and the average score was calculated by dividing it by the total number of knowledge questions. Knowledge was then graded as excellent for scores of $\geq$80%, good for scores of 50–79% and poor for scores of $<$50%. Good and excellent were categorised as good knowledge with poor in another category. To compute for handwashing practice, respondents who washed all critical parts of their hands were categorised as performing correct handwashing practice, while those who did not were classified as handwashing incorrectly. Descriptive statistics were performed and results are presented in the tables. Regression modelling for determining the predictors of knowledge and practice of COVID-19 prevention (as outcome variable) was performed with crude and adjusted ORs (AORs) with 95% CIs. p was set at 0.05. Sociodemographic characteristics and knowledge were exposure variables incorporated into the regression model.

Results

A total of 1294 people consented to participate in the study. The respondents were aged 18– 80 y with 422 (32.6%) aged 35–44 y. The average age was 39.6 y with a SD of 11.9 y. More than half of the respondents (710; 54.9%) were male, more than a third were unemployed (476; 36.8%), with more than half having secondary education as their highest level of education (685; 52.9%) (Table 1).

Almost all respondents (1271; 98.2%) had heard about COVID-19. The three most common sources of information about COVID-19 were radio jingles (1102; 86.7%), television adverts (940; 74.0%) and announcements in church (612; 48.2%). Only 441 (34.7%) of those who had heard of COVID-19 were aware that the disease was caused by a virus, 299 (23.5%) wrongly associated COVID-19 with causes other than a virus, while 531 (41.8%) reported that they did not know the cause of COVID-19 (Table 2). Of those respondents who were aware of COVID-19, 1112 (87.5%) reported that the virus spreads through contact with a person who has coronavirus disease, 743 (58.5%) reported that it spread through contact with contaminated surfaces, the bedding or the clothing of a person who has coronavirus disease, 727 (57.2%) reported that it spread through hugging and kissing, 718 (56.5%) by touching the blood, urine, stool or saliva from a person who

Table 1. Sociodemographic characteristics of the study participants

Variable	Frequency (n=1294)	%
Age, y		
<25	110	8.5
25–34	347	26.8
35–44	422	32.6
45–54	260	20.1
55–64	120	9.3
≥65	35	2.7
Mean±SD	39.6±11.9 y	
Median	38 y	
Mode	36 y	
Range	18–80 y	
Gender		
Male	710	54.9
Female	584	45.1
Occupation		
Senior public servants; professional; manager; large-scale traders; businessman; contractors	235	18.2
Intermediate grade public servants and senior schoolteachers	117	9.0
Junior schoolteachers; drivers; artisans	107	8.3
Petty traders; labourers; messengers and similar	359	27.7
Unemployed	476	36.8
Religion		
Christian	1246	96.3
Islam	19	1.5
Traditional	23	1.8
Other	6	0.5
Highest level of education		
No formal education	38	2.9
Primary education	120	9.3
Secondary education	685	52.9
Tertiary education	451	34.9

has coronavirus disease and 698 (54.9%) reported that it spread through participation in the burial rites of a person who has died from coronavirus disease. Only 36 (2.8%) of the respondents reported that they did not know how COVID-19 spread.

The three most frequent symptoms of COVID-19 identified by the respondents were fever (1187; 93.4%) cough (1134; 89.2%) and difficulty in breathing (1010; 79.5%). A total of 834 (66.4%) of respondents were aware that the signs and symptoms of COVID-19 manifest in an infected person 2–14 d after contracting the virus, 967 (76.1%) were aware that there is no specific drug treatment for COVID-19 and 1006 (70.2%) were aware that there was no specific vaccine for COVID-19. Overall, 608 (47.0%) of respondents had poor knowledge regarding COVID-19, 587 (45.4%) had good knowledge, while only 99 (7.7%) had excellent knowledge concerning COVID-19 (Table 3).

About 1167 (90.2%) of respondents who are were aware of COVID-19 acknowledged that COVID-19 is a problem in the state because it has no cure (817; 70.0%), it is highly infectious (797; 68.3%), it is a deadly disease (788; 67.5%) and creates a lot of panic (779; 66.8%). Those who did not consider COVID- 19 a problem reported that it is just being exaggerated (64; 50.4%), that people just want to make money with coronavirus interventions (52; 40.9%) and that they do not believe that there are cases of coronavirus (47; 37.0%).

Four hundred and forty-three (34.9%) of respondents believed that they cannot contract the virus, while 801 (63.0%) acknowledged that the government is doing enough to contain the virus. Most respondents would go to the hospital (905; 71.2%) or call the coronavirus helpline number (868; 68.3%) if they develop signs and symptoms of COVID-19. A total of 743 (58.5%) respondents had heard of the coronavirus helpline number but only 116 (15.6%) of those could provide the number when it was requested. Also, 522 (41.1%) had heard of the Nigeria Centre for Disease Control (NCDC) coronavirus information website/social media account, but only 53 (10.2%) of those could provide the details when asked. A total of 833 (65.5%) respondents claimed they were comfortable living or working with a person treated for COVID-19 (Table 4).

Among those respondents who had heard of COVID-19, 1150 (90.5%) reported that they prevent COVID-19 by practising regular handwashing with soap and water, 1081 (85.1%) by maintaining physical distance, 857 (67.4%) by regular use of

Table 2. Awareness of COVID-19 in Rivers State

Heard of COVID-19 (n=1294)	Frequency (n=1271)	%
No	23	1.8
Yes	1271	98.2
Source of information about COVID-19 (multiple responses)		
Radio	1102	86.7
Television	940	74.0
Church	612	48.2
Social media (Facebook, Twitter, WhatsApp)	607	47.8
GSM/SMS	568	44.7
Peers/friends	523	41.1
Family member	512	40.3
Town announcer	501	39.4
Health facility	490	38.6
Newspaper	410	32.3
Flyer	400	31.5
Health educator	371	29.2
Neighbourhood	340	26.8
Internet sites	336	26.4
Market	315	24.8
Journal	222	17.5
Mosque	76	5.9
Other	2	0.2
Causes of COVID-19		
Virus	441	34.7
Cause other than a virus	299	23.5
Do not know	531	41.8

Abbreviations: GSM, Global System for Mobile Communication; SMS, Short Message Sending.

hand sanitiser and 815 (64.1%) by avoiding crowded places/events. During a demonstration of handwashing, only 505 (39.0%) of respondents washed all the critical parts of their hands correctly (Table 5).

Age, occupation, level of education and location significantly predicted a respondent's knowledge about COVID-19 when the OR was unadjusted. When the OR was adjusted, occupation, education and location remained as significant predictors of knowledge about COVID-19. Respondents within occupation group 2 (including junior schoolteachers, drivers, artisans, petty traders, labourers, messengers and similar occupational personnel) were about 1.4 times significantly more likely to have poor knowledge about COVID-19 than those in occupation group 3 (unemployed) (AOR=1.393, 95% CI 1.069 to 1.815, p=0.014). Similarly, it was also shown that the odds of having poor knowledge about COVID-19 were about 4.7 times significantly more likely among respondents with no formal education (AOR=4.707, 95% CI 1.897 to 11.678, p<0.001), about 1.9 times significantly more likely among those with primary education (AOR=1.944, 95% CI 1.225 to 3.083, p=0.005) and about 0.7 times significantly less likely among respondents with secondary education (AOR=0.755, 95% CI 0.576 to 0.989, p=0.041) than among those with tertiary education. Also, respondents who resided in rural areas were about 1.7 times more likely to have poor knowledge about COVID-19 compared with those who lived in urban centres (AOR=1.748, 95% CI 1.285 to 2.378; p<0.001) (Table 6).

The significant predictors of appropriate COVID-19 preventative practices were age, occupation, location and knowledge about COVID-19. The exposure variable was knowledge about COVID-19 while the other variables (age, occupation, location and education) were covariates. Respondents who were aged <50 y were about 60% less likely not to practise handwashing than those who were aged ≥50 y (AOR=0.595, 95% CI 0.422 to 0.837, p=0.003); those in occupation group 2 were about 1.4 times more likely not to practise handwashing than those in occupation group 3 (AOR=1.929, 95% CI 1.414 to 2.630, p<0.001); those who resided in rural areas were about 2.3 times more likely not to practise handwashing than those who resided in urban centres (AOR=2.348, 95% CI 1.652 to 3.338, p<0.001) and those who had poor knowledge of COVID-19 were about 7.7 times more likely not to practise handwashing than those who had good knowledge (AOR=7.745, 95% CI 5.936 to 10.105, p<0.001) (Table 7).

Discussion

It was encouraging that awareness regarding COVID-19 infection among community-based residents in the state was high a few months after the index case of the disease was recorded. This was an affirmation of broadcast media (radio and television) as the most viable channel for risk communication within

Table 3. Respondents' knowledge of COVID-19 across the 23 LGAs of Rivers State

	Frequency (n=1271)	%
How COVID-19 spreads (multiple responses)		
Contact with a person who has coronavirus disease	1112	87.5
Contact with contaminated surfaces, bedding and clothing of a person who has coronavirus disease	743	58.5
Hugging, kissing	727	57.2
Touching blood, urine, stool or saliva from a person who has coronavirus disease	718	56.5
Participating in burial rites of a person who has died from coronavirus disease	698	54.9
Sharing sharp objects such as razors, needles with a person who has coronavirus disease	562	44.2
Through the air	467	36.7
Through sexual intercourse	331	26.0
From infected animals to humans	247	19.4
I do not know	36	2.8
Other	23	1.8
Signs and symptoms of COVID-19 (multiple responses)		
Fever	1187	93.4
Cough	1134	89.2
Difficulty in breathing	1010	79.5
Sore throat	734	57.7
Weakness	587	46.2
Headache	584	45.9
A general feeling of being unwell	442	34.8
Body pain	243	19.1
Diarrhoea	165	13.0
Vomiting	158	12.4
Rash on the body	107	8.4
Sneezing	34	2.7
Other	2	0.2
When signs and symptoms of COVID-19 manifest, d		
<2	39	3.1
2–14	844	66.4
>14	142	11.2
I do not know	246	19.4
There is specific drug treatment for COVID-19		
No	967	76.1
Yes	47	3.7
I do not know	257	20.2
There is a specific vaccine for COVID-19		
No	1006	79.2
Yes	15	1.2
I do not know	250	19.7
Overall knowledge score		
Poor	608	47.7
Good	567	45.5
Excellent	99	7.8

the state. Radio and television are potent sources of information for people and stand out as channels for epidemic response efforts. They should therefore be engaged early and effectively. The high level of awareness of COVID-19 found in this study was similar to that obtained in China early in the outbreak,[8] but contrasted significantly to other studies in Nigeria, where COVID-19 awareness remained poor several weeks into the pandemic.[9,10] This observed awareness was closely followed by good knowledge scores on COVID-19 transmission, as well as signs and symptoms of the disease such as fever, cough and breathing difficulties, in more than half of the study respondents. This is also commendable because knowledge of the modes of disease transmission and signs and symptoms of a disease is the first proactive step to understanding the measures of disease prevention and

Table 4. Attitude of respondents towards the COVID-19 outbreak in Rivers State

	Frequency (n=1271)	%
COVID-19 is a problem		
No	127	9.8
Yes	1167	90.2
Reasons why COVID-19 is not a problem (n=127; multiple responses)		
It is just being exaggerated	64	50.4
People just want to make money from coronavirus	52	40.9
Intervention		
I do not believe that there are cases of coronavirus	47	37.0
There are only a few cases	30	23.6
Other	8	6.3
Reasons why COVID-19 is a problem (n=1167; multiple responses)		
It has no cure	817	70.0
It is highly infectious	797	68.3
It is a deadly disease	788	67.5
It creates a lot of panic	779	66.8
It is an attack from the Western world	288	24.7
Other	125	10.7
I can contract COVID-19		
No	443	34.9
Yes	676	53.2
I do not know	152	12.0
Government is doing enough to contain the COVID-19 outbreak		
No	258	20.3
Yes	801	63.0
I do not know	212	16.7
What I will do when I develop signs and symptoms of COVID-19 (multiple responses)		
Go to the hospital	905	71.2
Call the coronavirus help number	868	68.3
Stay at home	328	25.8
Pray	141	11.1
Treat myself	52	4.1
Go to a traditional healer	47	3.7
Go to a religious centre	32	2.5
Hide	15	1.2
Do nothing	8	0.6
Other	10	0.8
What I will advise a family member, relative or neighbour who develops signs and symptoms of COVID-19 (multiple responses)		
Go to the hospital	892	70.2
Call the coronavirus help number	869	68.4
Stay at home	324	25.5
Pray	153	12
Go to a traditional healer	55	4.3
Treat yourself	47	3.7
Go to a religious centre	28	2.2
Hide	17	1.3
Do nothing	5	0.4
Other	6	0.5
I would live or work with a person with COVID-19 who has been treated, tested negative and discharged		
No	437	34.4
Yes	833	65.5

Table 4. Continued.

	Frequency (n=1271)	%
Heard of the coronavirus helpline(s)		
No	528	41.5
Yes	743	58.5
Correctly gave the helpline(s) (n=743)		
No	627	84.4
Yes	116	15.6
Heard of NCDC coronavirus information, website or social media account		
No	749	58.9
Yes	522	41.1
Correctly gave the website (n=522)		
No	469	89.8
Yes	53	10.2

Abbreviation: NCDC, Nigeria Centre for Disease Control.

Table 5. Practice for prevention of COVID-19 transmission

	Frequency (n=1271)	%
How you prevent yourself from getting COVID-19 (multiple responses)		
Regular handwashing with soap and water	1150	90.5
By keeping your distance from any person with suspected coronavirus disease	1081	85.1
Regular use of hand sanitiser	857	67.4
By avoiding crowded places/events	815	64.1
By staying at home	681	53.6
Regular handwashing with water only	105	8.3
Regular gargling/drinking of water	66	5.2
By drinking concoctions (lime, ginger, garlic, etc.)	65	5.1
Taking chloroquine	59	4.6
Going for special prayers	49	3.9
Eating bitter kola	42	3.3
Avoid eating bushmeat	35	2.8
Bathing with saltwater	25	2.0
Other	16	1.3
I do not know	14	1.1
Washed all critical parts of the hands (n=1294)		
No	789	61.0
Yes	505	39.0

control, otherwise known as primary prevention. Nevertheless, good knowledge was not observed for slightly less than half of respondents and did not sufficiently translate to good prevention practices among people. This was because while regular handwashing was reported to have been practised by most respondents, only a third of the respondents satisfactorily demonstrated all the handwashing steps. This supports the assertion that knowledge does not always automatically translate into good practice without going through the structured stages of declarative, procedural and autonomous processes involved in the transition from knowledge to practice.[12] This finding has huge implications for the prevention and control of the disease in the state and therefore cannot be glossed over by the PHEOC. It suggests a paradigm shift in the risk communication process by reprogramming its communication strategies to include skills-based packages, to make significant, meaningful impacts in healthy behavioural change among people concerning COVID-19 virus transmission truncation in the state.

It was also disturbing that a third of participants responded with a stigmatising attitude towards people who have been

Table 6. Predictors of knowledge of COVID-19

	COR	95% CI for COR		p	AOR	95% CI for AOR		p
		Lower bound	Upper bound			Lower bound	Upper bound	
Age (y)								
<50	0.723	0.554	0.945	0.017*	0.840	0.629	1.120	0.234
≥50	1				1			
Gender								
Male	1.064	0.854	1.325	0.581	1.108	0.877	1.400	0.388
Female	1				1			
Occupation								
Group 1	0.978	0.743	1.289	0.877	0.884	0.645	1.210	0.440
Group 2	1.334	1.031	1.726	0.028*	1.393	1.069	1.815	0.014*
Group 3	1				1			
Highest level of education								
None	4.565	1.872	11.132	0.001*	4.707	1.897	11.678	0.001*
Primary	2.165	1.397	3.355	0.001*	1.944	1.225	3.083	0.005*
Secondary	0.839	0.661	1.064	0.148	0.755	0.576	0.989	0.041*
Tertiary	1				1			
Location								
Rural	1.579	1.175	2.122	0.002*	1.748	1.285	2.378	<0.001*
Urban	1				1			

Abbreviation: COR, Crude Odds Ratio; AOR, Adjusted Odds Ratio.
Group 1 = Senior public servants, professionals, managers, large scale traders, businessmen, contractors, intermediate grade public servants and senior school teachers; Group 2 = Junior school teachers, drivers, artisans, petty traders, laborers, messengers and similar occupational personnel, Group 3 = Unemployed.
*Statistically significant at $p<0.05$.

treated for COVID-19. This was not particular to our study alone as other researchers have reported similar occurrences in their environments.[11,13] The fact that the disease is new, with many unknowns, and that people are often afraid of the unknown, evokes the fear factor among individuals, including community dwellers. It is therefore understandable why there is confusion, anxiety and fear among the public. Unfortunately, however, these factors are also fuelling harmful stereotypes and labelling of individuals, which in turn drives discrimination and loss of status because of a perceived link with the disease.[11] The result of this can drive the epidemic underground by making people hide with the illness to avoid discrimination, as well as preventing people from immediately seeking healthcare and discouraging them from adopting healthy behaviour. All of these factors can result in more severe health problems by increasing the difficulties in controlling the disease's outbreak.

Another salient issue that might have promoted stigma and discrimination was the unprofessional way in which the print and broadcast media portrayed the disease at inception as highly infectious and deadly. This created a lot of panic in the minds of people who developed a perception that the disease was a huge problem. This therefore created a paradox in the COVID-19 risk communications from the state, and further underscores the importance of periodic media engagement and capacity building in ethical reporting and accurate information dissemination, as the media are critical partners in the disease outbreak response.[14]

Occupation, level of education and location significantly predicted respondents' knowledge about COVID-19 while age, occupation, location of residence (rural or urban) and knowledge about COVID-19 significantly predicted the practice of COVID-19 prevention. A study conducted by Tadesse et al. reported similar findings for predictors of knowledge about COVID-19 but only highlighted income as the sociodemographic predictor of the practice of COVID-19 prevention.[15] The current study brings to the fore the relevance of adopting skills-based approaches in health risk communication and timely and effective media engagement in ethical reporting of health matters during disease outbreaks to mitigate stereotyping, stigmatisation and discrimination, all which have severe implications for epidemic prevention and control.[16] It also underscores the importance of targeted messaging for various categories of people, such that the communication medium of COVID-19 prevention messaging is modified to best suit age, educational level and socioeconomic status. The findings from this study have led to a reprogramming of the risk communication strategy of the public health emergency response for COVID-19 to include sufficient practice of elements that demonstrate the correct COVID-19 prevention methods, such as hand hygiene, social distancing and appropriate use of face masks.

The weakness of this study is its cross-sectional design, which was based on self-reporting and is therefore subject to information bias. However, the logistic regression, the large sample size and spread of respondents across all the LGAs of the state

Table 7. Predictors of the practice of COVID-19 prevention (handwashing)

	COR	95% CI for COR		p	AOR	95% CI for AOR		p
		Lower bound	Upper bound			Lower bound	Upper bound	
Age, y								
<50	0.613	0.463	0.812	0.001*	0.595	0.422	0.837	0.003*
≥50	1				1			
Gender								
Male	0.938	0.749	1.174	0.574	0.999	0.761	1.31	0.992
Female	1				1			
Occupation								
Group 1	0.865	0.656	1.141	0.304	0.765	0.535	1.094	0.143
Group 2	1.890	1.442	2.477	<0.001*	1.929	1.414	2.630	<0.001*
Group 3	1				1			
Highest level of education								
None	3.918	1.606	9.557	0.003*	2.259	0.86	5.935	0.098
Primary	1.784	1.154	2.758	0.009*	0.998	0.59	1.688	0.995
Secondary	1.109	0.871	1.411	0.402	1.009	0.734	1.387	0.955
Tertiary	1				1			
Location								
Rural	2.333	1.731	3.142	<0.001*	2.348	1.652	3.338	<0.001*
Urban								
Knowledge about COVID-19	1				1			
Poor	8.030	6.221	10.366	<0.001*	7.745	5.936	10.105	<0.001*
Good	1				1			

*Statistically significant at $p<0.05$.

make this a relevant piece of research and thus is a strength of the study.

Conclusion

Risk communication interventions during pandemics need to be based on an understanding of the gaps in and predictors of knowledge, attitudes, perceptions and practice. Patronised communication channels such as broadcast media should be maximally utilised to foster behavioural change communication for the control of current and future epidemics. Interventions must target and address identified predictors to be successful.

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