

Contexts, beliefs and health behaviour: Are individuals who engage in risky sexual behaviour likely to wear face-masks against COVID-19?

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Abstract

Beside age, underlying comorbidities and availability of sanitation facilities, individual health beliefs and behaviour are critical in combating the sustained prevalence of Covid-19. Behaviour has, however, been shown to be consistent but could be context-dependent based on the individual's beliefs. To investigate whether or not individuals' protective behaviour against coronavirus is associated with their behaviour in a previous health context. Facemask usage and engagement in risky sexual behaviour (RSB) were employed as corollaries of Covid-19 protective behaviour and a previous health context respectively. Data on them and other sociodemographic correlates of health behaviour were collected on 522 Nigerians via a web-based survey. The data were analyzed using frequency, Chi Square and Binary Logistics Regression. About 31% of the population wore face-masks in public, 48.1% believed Covid existed and was severe, and 31.6% had engaged in RSB. Individuals who engaged in RSB had lower odds of wearing face-masks in public in both the general population and across the rural-urban divide. The relationship was, however, only statistically significant (OR:0.642, $p < 0.05$) in the adjusted regression model. Other significant determinants of facemask use were gender, place of residence, employment status and beliefs about Covid. The similarity of individual beliefs and behaviours in different health contexts provides an opportunity to model behaviour change communication policies for preventing and combating the spread of coronavirus and other infectious diseases.

Introduction

The sustained prevalence of Covid-19 since its emergence in late 2019, in spite of lockdown and other measures instituted by governments across the world to control its transmission, can be attributed to, among other factors, the attitude and behavioural dispositions of the population towards the pandemic. Other notable factors implicated in the sustained transmission include access to sanitation facilities, age and underlying comorbidities.^{1,2} While the literature is replete with evidence to show that attitude and behaviour, encapsulated in health beliefs, matter for the spread of infectious diseases, studies have further confirmed same to be valid with Covid-19.³⁻⁸ Individuals, according to the health belief model (HBM), prevent or expose themselves from/to diseases based on their perception of their susceptibility, the severity of the disease, benefits accruable from engaging in protective behaviour, barriers to the protective behaviour, factors that could lead them to adopting the protective behaviour, and their perceived efficacy of the protective action.⁹⁻¹¹

Given the freedom to choose therefore, individuals may engage in health behaviour that put them and others at risk of infection. In the context of Covid-19, this includes non-wearing of facemasks and non-observance of physical isolation and social distancing. The spike in the daily infection rate in India from a peak of 90,000 in September 2000 to nearly 400,000 cases in April-May of 2021 after a relaxation in Covid-19 restrictions to allow for some political and religious activities,¹² exemplifies the association between risky health behaviour and a rise in the level of infections of Covid-19. Further, and as equally shown in other health contexts, particularly with HIV/AIDS and other sexually transmitted infections (STIs), individual choices, typified by their health behaviour, have also been critical in explaining the pattern and level of transmission and prevalence of diseases.^{11,13-15} The risky health behaviour associated with HIV/AIDS and other STIs includes having multiple sexual partners, including extra-marital sexual relationships, inconsistent condom use with casual partners, early sexual debut, and sexual modification.

The health belief model, that has been used to explain individual health behaviour in many health contexts, including with risky sexual behaviour for the transmission of HIV/AIDS and STIs and most recently under Covid-19, is a behavioural theory in social psychology. On the premise that behaviour, which has been described in psy-

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Ethics approval and consent to participate: The data collection instrument was anonymized, and the introductory section explained the aim and purpose of the study to the potential respondents. Respondents who agreed to proceed with completing the questionnaire gave their consent for their responses to be used for the study.

Informed consent: The manuscript does not contain any individual person's data in any form.

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chological studies, as a consistent habit and an attribute that rarely changes,¹⁶⁻¹⁷ has implications for disease transmission and health seeking, this study investigates

whether there would be an association between an individual's health behaviours in different health contexts. Verplanken *et al.*¹⁸ and Wood and Neal¹⁹ describe habit as a behaviour that is acquired over time and exhibited as an automatic response to an event in a normal context. In such contexts, an individual's habits will automatically override intentions to exhibit a contrary behaviour.²⁰ Verplanken²¹ however argues that although, once formed, habits direct behaviour automatically, they are context dependent.¹⁶ This implies that an individual's perception of normality or stable environment subconsciously reflects in their behaviour to an event.

In the context of the foregoing and using data on condom use and multiple sexual partnership as measures of risky sexual behaviour, and the use of facemasks in public as a preventive health behaviour against the transmission of Covid-19 in Nigeria, this study hypothesizes that individuals who engage in risky sexual behaviour are also more likely to exhibit the same risky health behaviour under Covid-19. In other words, individuals who consider the incidence of HIV/AIDS and STIs as normal and exhibit sexual behaviour that put them at risks of infection are also likely to consider Covid-19 as a normal event requiring no protective behaviour. The study commences with an investigation of the population's sociodemographic characteristics and their beliefs about Covid-19 on the one hand, and their usage of facemasks in public to prevent contracting or transmitting the virus and their RSB status on the other hand. We proceed to establishing an association between the latter and providing explanations on the observations using the former. Owing to their differential socioenvironmental characteristics, the study further compares the outcomes in rural and urban Nigeria. The findings are expected to inform behaviour change communication policies for combating the spread of coronavirus.

Materials and methods

Data source and collection

Data for the study was collected using a web-based survey of individuals living in the six geopolitical regions of Nigeria. The survey was conducted between September and October 2020. The survey link was created using google and shared with respondents via WhatsApp, Facebook and direct email using snowball sampling. The link was shared with the authors' acquaintances who were in turn informed to forward same

to their own acquaintances and to continue the chain. Multiple responses from respondents were prevented in the survey link. At the end of the survey period, a total of 522 respondents had validly completed survey and their responses were used for the study.

Description of variables

The study made use of one dependent/outcome variable – the use of facemasks in public. The respondents were asked if they were always using facemask when going to public places or not. The options were yes, not always, and no. The responses were then coded as 1 if they answered yes and 0 if they didn't wear facemasks always or at all. The main explanatory variable, engagement in risky sexual behaviour (RSB) was derived from three questions. The questions were if the respondents had ever had sex with someone other than their spouse/partner since they got together; how many sexual partners the respondents have had in the past one year; if the respondents previously or currently used condom when having sex with someone other than their spouse/regular partner. The responses were then coded individually for the three questions as 1 if the respondents had not had sex with anyone beside their partners, had one sexual partner, and were either not having sex with anyone else or using condom when having sex with anyone other than their partner. Responses to having sex with someone other than their spouses, having more than one sexual partner, and not using condom with someone other than their spouses/regular partner were coded as 0.

Using the responses, we derived a dummy variable of risky sexual behaviour by aggregating the responses to the three questions. Respondents who recorded a 1 in each of the three questions were categorized as not engaging in RSB while respondents who recorded a 0 in at least one of the three questions were categorized as engaging in RSB. Engagement in RSB was thereafter coded as 0 while non-engagement was coded as 1. Furthermore, the individual-level explanatory variables used were gender (male/female), age (<30years/30-39 years/40+ years), marital status (never or previously married/married), employment status (unemployed/employed), income (<50,000/50,000-99,999/100,000+ Naira), place of residence (rural/urban residence), region of residence (Northern/Southern Nigeria). As all the respondents were recruited via the web, they were assumed to be educated and as such, education in the study was categorized as below tertiary and tertiary levels.

Data analysis

All the analyses were carried out at three levels. These were at the rural, urban and total survey population levels. Univariate analysis was used to describe the characteristics of the study population, while bivariate analysis, using Chi-Square test, was used to identify the associations between the use of facemasks and the explanatory variables of the study. Finally, binary logistic regression models, with confident levels set at 95%, were used to determine the effects of the explanatory variables on the use of facemask by the respondents. Three regression models were estimated for the study. The first model investigated the effects in rural Nigeria, the second investigated the effects in urban Nigeria while the third was on the entire population of study.

Results

Characteristics of study population

The study population of 522 comprised of more males (51.7%) than females. There were respondents aged below 30 (40.4%) and respondents who had either never married or had previously married accounted for 55% of the population. As shown in Table 1, more than 96% of the respondents had tertiary education, 59.2% were employed and more than 41% had monthly income that was less than N50,000 (around \$100). Geographically, nearly 70% of the respondents were based in southern Nigeria while only 12.5% of the respondents lived in rural areas. The gender, age, marital status, education, employment status, and income patterns between urban and rural respondents were largely similar with those obtained across the general population of study as shown in Table 1.

More than 30% of the population indulged in RSB, 50% believed Covid-19 exists but not as serious as being touted and nearly 70% either did not wear facemasks or were not consistent in wearing them. The rural-urban pattern in indulgence in risky sexual behaviour, belief in the incidence and severity of Covid, and the use of facemasks was also similar to the national pattern but with a much higher proportion of rural dwellers wearing facemasks (41.5%) compared to urban respondents (29.3%) (Table 1).

Dimensions of facemask usage

Among the general population and when disaggregated by place of residence,

more females used facemasks than male. Respondents aged 40 and above (36.6%), who were married (34%), lived in rural areas (41.5%), and in southern Nigeria (32.5%) had higher usage of facemasks among the general population. Similar patterns were recorded by place of residence as shown in Table 2. Respondents who had higher education, and who earned between N50,000 and less than N100,000 a month had higher facemasks usage as well. The use of facemasks was however more prevalent among respondents who had indulged in RSB. The prevalence was 34.5%, 50% and 32.4% among respondents who engaged in RSB at national, rural and urban levels. Conversely and expectedly, facemasks usage was higher among respondents who perceived Covid as being serious; 45% (general population), 55.2% (rural areas) and 43.7% (urban areas). It was lowest among respondents who believed Covid

does not exist. The associations were statistically significant for gender, place of residence and belief.

Predictors of facemask usage

Engaging in risky sexual behaviour was found to be associated with lower odds of wearing facemasks among the general population and in both rural and urban Nigeria. The odds ratios (0.779, 0.607 and 0.806 respectively) were however not statistically significant as shown in Table 3. When other sociodemographic confounders of mask usage were introduced into the regression model, individuals who engaged in risky sexual behaviour were also found to be less likely to wear facemasks. In the adjusted model however, the relationship became statistically significant among the general population (OR: 0.642) but remained insignificant in rural and urban areas. Other significant predictors of mask usage in the

adjusted model were gender (OR:2.195), place of residence (OR: 2.178), employment status (OR:2.343) and belief (OR:3.840–9.053). With respect to belief, individuals who believed Covid exists and is serious were nine times more likely to wear masks while individuals who believed it exists but not as serious were three times more likely to wear masks (Table 4).

Discussion

That only about 31% of the population of study wore facemasks consistently shows a somewhat lukewarm attitudinal disposition to Covid-19 in Nigeria. The attitude was worse in urban Nigeria where less than 30% wore facemasks. The attitude is best understood in the context of the population's beliefs about the severity of the pandemic in Nigeria. Half of the general popu-

Table 1. Sociodemographic characteristics of study population at national level and by place of residence.

Spatial Unit	National (%)	Rural (%)	Urban (%)
Variables	N=522	N=65	N=457
Gender			
Female	48.3	47.7	48.4
Male	51.7	52.3	51.6
Age			
<30	40.4	66.2	36.8
30-39	33.9	20.0	35.9
40+	25.7	13.8	27.4
Marital status			
Never/previously married	55.0	69.2	53.0
Married	45.0	30.8	47.0
Type of place of residence			
Rural	12.5	-	-
Urban	87.5	-	-
Region of residence			
North	31.0	29.2	31.3
South	69.0	70.8	68.7
Highest education			
Below tertiary	3.8	12.3	2.6
Tertiary	96.2	87.7	97.4
Employment status			
None/student	22.4	32.3	21.0
Employed	59.2	53.8	60.0
Previously employed	18.4	13.8	19.0
Income per month (Naira)			
0-<50,000	41.8	56.9	39.6
50,000-99,999	22.6	16.9	23.4
100,000+	35.6	26.2	37.0
RSB status			
No	68.4	69.2	68.3
Yes	31.6	30.8	31.7
Belief about Covid			
It exists and is serious	48.1	44.6	48.6
It exists but not serious	50.0	50.8	49.9
It doesn't exist	1.9	4.6	1.5
Wearing of mask			
Yes, always	30.8	41.5	29.3
No or not always	69.2	58.5	70.7

lation of study believed Covid-19 exists but was not as serious as people are being made to believe. About 2% believed the virus was a hoax. In the rural landscape, nearly 5% of the population believed the virus does not exist. Even in the urban areas where a higher proportion of the population believed Covid-19 exists and is a serious health issue (48.6%), the wearing of masks among the urban population was still less than 30%. One explanation for this pattern lies in the country's Covid statistics relative to other African countries with which Nigeria benchmarks itself - Egypt and South Africa, and countries outside the continent with supposedly better healthcare systems to

deal with the virus.

By the first of April, 2020, when the virus had fully berthed in Africa, Nigeria had a total case of 174, while Egypt and South Africa had 779 and 1,380 cases respectively. In the same period, the number of cases were 2,947 and 168,208 cases in the United Kingdom (UK) and the United States of America (USA) respectively. By the first of September of the same year, the cases had risen to 99,115, 628,259, 337,168, and 5,961,616 in Egypt, South Africa, UK and USA respectively.²² It was 54,247 in Nigeria.²² With the numbers (and associated fatalities) in these countries, many Nigerians believed the virus either did not

exist or wasn't as serious in its prevalence in Nigeria. When the beliefs were modelled into the regression equations, the results clearly reflect in the population's odds of wearing facemasks as a protective behaviour against the Coronavirus. Relative to those who believed Covid-19 did not exist in Nigeria, those who believed it existed but not as serious were three times more likely to wear a mask, whereas those who believed it existed and was serious were nine times more likely to wear facemasks. Beliefs therefore matter in health behaviour,⁹⁻¹¹ including with Covid-19.³⁻⁸

Beyond beliefs, the sociodemographic characteristics of the study population fur-

Table 2. Sociodemographic dimensions of mask usage by place of residence.

Spatial unit, variables	National		Rural		Urban	
	N=522	F-Value	N=65	F-Value	N=457	F-Value
Gender		7.330**		2.477		5.303**
Female	36.5		51.6		34.4	
Male	25.6		32.4		24.6	
Age	2.947		0.850		3.598	
<30	28.0		39.5		25.0	
30-39	29.9		38.5		29.3	
40+	36.6		55.6		35.2	
Marital Status		2.051		0.143		2.684
Never / Previously Married	28.2		40.0		26.0	
Married	34.0		45.0		33.0	
Type of Place of Residence		3.982**		-		-
Rural	41.5		-		-	
Urban	29.3		-		-	
Region of Residence		1.943		1.097		0.759
North	27.2		31.6		26.6	
South	32.5		45.7		30.6	
Highest Education		0.333		1.028		0.111
Below Tertiary	25.0		25.0		25.0	
Tertiary	31.1		43.9		29.4	
Employment Status		3.502		1.545		3.132
None/Student	33.3		52.4		29.2	
Employed	32.4		37.1		31.8	
Previously Employed	22.9		33.3		21.8	
Income per Month (Naira)		1.975		0.086		2.894
0-<50,000	27.5		40.5		24.9	
50,000-99,999	33.9		45.5		32.7	
100,000+	32.8		41.2		32.0	
Belief about Covid		45.846**		5.266**		43.037**
It exists and is serious	45.0		55.2		43.7	
It exists but not serious	18.0		33.3		15.8	
It doesn't exist	10.0		0.0		14.3	
RSB Status		1.551		0.852		0.980
No	29.1		37.8		27.9	
Yes	34.5		50.0		32.4	

**Significant at $p < 0.05$.

Table 3. Unadjusted odds ratio of the relationship between mask wearing and RSB.

Spatial unit, variables	National Odds Ratio	Rural Odds Ratio	Urban Odds Ratio
RSB Status			
No	RC	RC	RC
Yes	0.779	0.607	0.806

RC, Reference Category.

ther illuminate their pattern of mask usage. Mask usage was more prevalent among respondents who were females, married, who had tertiary education, earned a minimum of N50,000 per month, and lived in rural Nigeria. Some studies have also shown this association elsewhere.^{4-6,8} Being female and married, particularly, suggests that the respondents' positive protective behaviour may transcend their individuality to caring for people around them. In other words, the need to protect their spouses and families from being infected may inform women and married individuals' choices to use facemasks. Education and income, on the other hand, offer knowledge and capacity for preventive behaviours. The higher prevalence of mask usage in rural Nigeria typifies the attitude to health between urban and rural areas. In urban areas of Malawi, for instance, only 12.5% of the population considered Covid and health risk.⁴ Because rural dwellers have lower educational levels and exposure, they tend to have a trust in health communications from the government than urban dwellers who tend to look

for loopholes and conspiracy theories in government policies and communications. This pattern of higher rural conformity has been found to underlie the utilization of healthcare services in rural areas, despite their having fewer healthcare facilities.²³

The relationship between risky sexual behaviour (RSB) and Covid preventive behaviour shows that individuals who engaged in RSB were less likely to wear facemasks as hypothesized. The relationship was same at the national level and in both rural and urban Nigeria. This suggests that individuals who engaged in RSB perceived the virus as not deserving of any special behavioural change. In other words, their perception of normality of RSB persists with coronavirus, hence the similar behaviour of lack of protection against both the consequences of RSB and Covid. Even though the consequences of RSB like STIs are not currently novel and advances in medicine and pharmaceuticals have made their treatment and management easier, one would have expected that the newness of coronavirus and its high fatality rate, owing

to a lack of curative medications, would have elicited a perception of severity, at least in the early stage of the disease. This finding suggests that health behaviour remains the same in different health contexts for as long as the perception of normality or severity remains the same.

The very few related studies on health behaviour under Covid, relative to previous health behaviour, found similar results.^{24,25} Nudelman *et al.*²⁴ observe that individuals who engaged in healthy lifestyle behaviours before the emergence of Covid were more likely to exhibit protective behaviours against the virus. Mantell *et al.*²⁵ also found that many commercial sex workers (80.1%), who used condoms with their patrons before Covid, wore facemasks to prevent them from contracting Covid in their line of work. The exhibition of similar health behaviour in different health contexts have also been reported in other studies.²⁶⁻²⁸ The findings buttress the underlying notion of stability in behaviour over time and that habits rarely change.^{16,17} Our findings also corroborate findings in works by Hagger *et*

Table 4. Adjusted odds ratio of the relationship between mask wearing and RSB.

Spatial unit, variables	National Odds Ratio	Rural Odds Ratio	Urban Odds Ratio
Gender			
Female	RC	RC	RC
Male	2.195**	3.788	2.129**
Age			
<30	RC	RC	RC
30-39	0.908	0.590	0.967
40+	0.634	0.373	0.668
Marital Status			
Never / Previously Married	RC	RC	RC
Married	0.798	0.818	0.786
Type of Place of Residence			
Rural	RC	-	-
Urban	2.178**	-	-
Region of Residence			
North	RC	RC	RC
South	0.894	0.355	0.987
Employment Status			
None/Student	RC	RC	RC
Employed	1.457	4.077	1.099
Previously Employed	2.343**	9.281**	1.836
Income per Month (Naira)			
0-<50,000	RC	RC	RC
50,000-99,999	0.713	1.043	0.729
100,000+	0.967	1.592	1.034
Belief about Covid			
It doesn't exist	RC	RC	RC
It exists but not serious	3.840**	3.039	4.273**
It exists and is serious	9.053**	11.873	5.271
RSB Status			
No	RC	RC	RC
Yes	0.642**	0.258	0.689

**Significant at p<0.05, RC – Reference Category.

al.,²⁹ Ouellette and Wood,³⁰ Sutton,³¹ and Laaksonen³² that past health behaviours serve as strong predictors of present health behaviours.

Limitations

This study is limited in two major ways. Firstly, the snowball sampling method employed may have inadvertently excluded a section of the general population who were not present on the internet and social media. Secondly, and closely related to the first limitation, is the issue of literacy among the respondents. Individuals without formal education, and who may not have a social media account, were not a part of the sampled population. These limitations suggest that using technology for non-contact data collection may exclude a section of the general population. We however believe that our sample is adequate enough to cover the subject addressed in this paper.

Conclusions

The coronavirus pandemic is still prevalent in spite of widespread communication about its prevalence and transmission modes. This may not be unconnected with the behavioural disposition of the population about its existence, severity, and their susceptibility. These beliefs, in turn, are reflected in the population's adoption of protective behaviour against the virus. On the premise that health behaviours are similar in different health contexts, this study hypothesized and found that individuals who engaged in RSB were also less likely to protect themselves against Covid-19. This finding presents an opportunity to model behaviour change communication for individuals and groups based on their previous health behaviour. Such modelling should inform a strategic focus for preventing and combating the spread of infectious diseases, including the coronavirus, through individual beliefs and behaviour.

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