# Knowledge, Attitudes, and Practices of Patients on COVID-19 Epidemic Attending a Primary Health Care Setting Durban, South Africa

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## **ABSTRACT**

There is no proven specific treatment or adequate vaccination roll out against COVID-19 infection in South Africa. Optimal infection control measures encompass primary intervention to minimize the spread of COVID-19. Public knowledge, attitude, and practices of dealing with this highly infectious respiratory disease play a vital role in limiting the spread of the infection. Aim was to identify knowledge, attitudes, and practices gaps on COVID-19 pandemic for possible health education intervention. The objectives were to determine the knowledge, attitude and practices of outpatients attending a primary health care facility. A cross-sectional descriptive survey was conducted. The Student's t-test and ANOVA test were carried out to determine the different mean scores for knowledge, attitudes and practices. Pearson's correlation test was conducted to determine the relationship between knowledge, attitudes, and practices scores. Binary logistic regression was undertaken to determine the predictor of good knowledge, positive attitude, and preventive practices. A total of 345 out-patient attendees participated of which 51% were male. Over half (52%) of respondents were evaluated as having good knowledge, 59% as having positive attitudes and almost all (95%) were practicing prevention of COVID-19. The knowledge of the respondent was correlated with preventive practices (r=.173, p<0.05). Multiple regression showed that respondents in the age groups 35-44 years and 45-54 years were 2.8 times and 5.7 times more likely to have good knowledge respectively. Nonsmokers were 79% less likely to have good knowledge (OR=.219, p<0.05). Respondents with no comorbidity were 50% less likely to have good knowledge (OR=.503, p <0.05), when compared to those having comorbidities. Respondents with the highest level of education was found to be positive predictor of positive attitudes (OR =7.3, p <0.05). Primary Health Care users have poor knowledge, negative attitudes but practiced properly for the prevention of the transmission of COVID-19. Mass education is required to educate communities to improve knowledge and attitudes on COVID-19 epidemic in SA.

Keywords: Out-patient, Kwadabeka Community Health Center, Comorbidity.

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# I. INTRODUCTION

The coronavirus disease known as the COVID-19 pandemic started in China is now a global health threat and possibly by far the largest outbreak of atypical pneumonia. [1] Human transmission has been observed via respiratory droplets and other modes causing widespread increase of between communities and countries patients Transmissibility of COVID-19 in South Africa (SA) as indicated by its reproductive number has been estimated at 2.95, suggesting that on average, every case of COVID-19 will infect up to three new cases [3]. The estimated average incubation period for the virus is measured to be 5.2 days, but with variation among patients and its capacity to asymptomatic spread [4]-[6]. The symptoms of infection which are important include fever, chills, cough, anosmia, sore throat, breathing difficulty, myalgia, nausea, vomiting,

diarrhoea, and others yet to be confirmed [7]. Older people (age > 50 years) with medical and surgical co-morbidities are reported to be more prone to the infection, and with greater severity [7]. Severe cases of COVID-19 are known to lead to cardiac injury, respiratory failure, and death [8]. The provisional case fatality rate as reported by the WHO is approximately 2%, although higher rates in the vicinity of 2.2% have been reported from SA and other countries [3], [9],

The COVID-19 outbreak has a significant impact on the lifestyle of the general population of SA and all other countries directly or indirectly. The National government of SA has taken commendable interventions to combat the spread of the COVID-19 pandemic based on the WHO recommendations. These included the national lock down, the suspension of public transportation, banning of international travel, closing of public places, close monitoring and management of communities and isolated care for infected people and suspected cases. As the pandemic started to spread to different parts of the country, the national government implemented lockdown of the entire country from 27 March to 30 September 2020 whereby social interaction was prohibited.

Currently there is no proven specific treatment or vaccination roll out against COVID-19 infection in SA. Optimal infection control measures are the primary interventions to minimize the spread of the virus in both health care settings and in the communities [11]. Public awareness of dealing with this highly infectious respiratory disease plays a vital role in limiting the spread of the infection, especially in middle- and low-income countries. As of 17 February 2021, the novel coronavirus has infected over 1.5 million people with 48 940 deaths [12]. Whilst waiting for vaccination roll out the management of the epidemic depends primarily on people's adherence to recommended universal preventive measures taken and these measures are largely affected by knowledge, attitudes, and practices (KAP) of the people [13]. To date most of the reports published on KAP of COVID-19 are based on on-line or phone call surveys and thus these surveys are not relevant in African or SA settings [14], [15].

To guarantee the final success, people's adherence to the prevention measures are essential, which is largely affected and influenced by their KAP towards COVID-19 in accordance with KAP theory [16], [17]. However, there is no research investigating the KAP of COVID-19 on the general population in SA. To make contribution for optimal COVID-19 outbreak management in SA, there is an urgent need to understand the awareness of the general population on COVID-19. Therefore, the objective of this study was to determine the knowledge, attitudes and practices of the patients attending a primary health care setting in Durban, South Africa.

## II. MATERIAL AND METHOD

# A. Study Design

A cross-sectional descriptive survey was conducted at Kwadabeka Community Health Center (KCHC), Durban during the COVID-19 epidemic in SA between 1 and 30 September 2020.

## B. Setting and Subjects

KCHC is situated in the communities of Kwadabeka and Clermont townships with residence of over 133000 black residents. Most of whom are reliant on KCHC as the first contact to public health facility. It provides comprehensive Primary Health Care (PHC) service package to its clients free of charge. The services include acute and chronic types of illnesses, male, female, adult, children, and pregnant women. There are over 20, 000 headcounts at KCHC every month. It is situated about 35 km north-west suburb of eThekwini (Durban) Metropolitan city. All residences are black homogenous Africans and living in formal and informal (mainly) dwellings.

# C. Sample Size, Selection and Data Collection

The determination of the sample size was undertaken using the Epi Info 7 software. As there were no similar studies related to COVID-19 epidemic in SA, the calculation was based on the assumption that the probability of having good knowledge on, positive attitude towards and COVID-19 preventive measures were 50.0%, at 95% confidence interval, 5% limit of precision and a design effect of 1.0.

Data was collected from adults (age >18 years) male and female attendees from the adult out-patients consulting rooms by the Medical Officers (including the investigators of the study) using a structured questionnaire both in English and isiZulu the local language, which ever was possible. The respondent was attending for any medical condition without the symptoms of COVID-19 infection. The suspected cases of COVID-19 were isolated at the triage area of the facility. The questionnaire was developed by the researchers based on published reports and dealt with demographics, knowledge, attitude. and practices of preventative health behavior of COVID-19. [18], [19] The study samples were selected from the patients attending KCHC outpatient departments. All patients who attended the doctor's consultation were asked to participate in the study after the consultation.

## D. Questionnaire

There were thirteen, five and six questions those were asked to determine participant's knowledge, attitudes and practices respectively regarding COVID-19. All the questions are dealt with in later sections.

## E. Measurements

Each correct answer by the participant for a question earned a score of '1' and each incorrect answer earned a score of '0'. Knowledge, attitudes, and practices were measured by adding the scores for the correct and incorrect answers or positive or negative statements. Scoring above 50% was considered good knowledge, positive attitudes, and good practices towards COVID-19.

## F. Data Analysis

Data were coded, captured, and analysed using SPSS version 22. Descriptive statistics such as mean with standard deviation (SD) for continuous variables and frequency distribution for categorical variables were reported. Student's t-test and ANOVA test were carried out to find different mean scores for KAP. Pearson's correlation test was conducted to determine the relationship between knowledge, attitudes, and practices scores. Binary logistic regression analysis was undertaken to determine the predictor of good knowledge, positive attitudes, and preventive practices. The results were presented with Odds Ratio (OR) with 95% confidence interval (CI). P-values <0.05 was considered statistically significant.

## G. Ethical Consideration

Ethical approval was obtained from Umgungundlovu Health Ethics Research Board (reference: UHERB 06/2020). Anonymity and confidentiality of the respondent were maintained at all times. Participation in the study was voluntary. Data was collected after obtaining informed consent from the participants.

## III. RESULTS

Demographic, personal and household (HH) risk factors can be seen in Table I. A total of 345 outpatient attendees participated in the study and male represented the most (51.4%). Most of the respondents were single (64.2%), age between 25 -44 years (52%), unemployed (55%) and low level of education (only 14% had matric qualification). Only 3% of the respondents were found to drink alcohol during the epidemic, but this rate was higher (17.5%) before the epidemic (regular drinker). Smoking habit was found among 10.5% during the epidemic which reduced from 14.3% before the epidemic. More than half (51.5%) of the respondents were found with vulnerable medical comorbidity. Among the comorbidities, HIV infection (27%) was the commonest followed by hypertension (18%) and diabetes (13.6%) (data not shown).

TABLE I: DEMOGRAPHIC, PERSONAL BEHAVIOR AND HOUSEHOLD RISK

INDICATORS OF THE RESPONDENTS			
Variables	Frequency	Percentage	
Gender (n=343)			
Male	168	49.0	
Female	175	51.0	
Marital status (n=340)			
Single	218	64.1	
Married	86	25.3	
Living together	24	7.1	
Widow	12	3.5	
Age (n=326)			
< 25 years	47	14.4	
25 - 34 years	103	31.6	
35 to 44 years	67	20.6	
45 to 54 years	41	12.5	
55 years and above	68	20.9	
Employment status (n=334)			
Full- time	99	29.6	
Part- time	49	14.2	
Unemployment	186	55.7	
Education level (n=341)			
No education	17	5	
1- 5 years schooling	29	8.5	
6 - 11 years of schooling	116	34	
Completed Matric	131	38.4	
Post matric/ Higher	48	14.1	
education	40	14.1	
Personal and household risk			
factors			
Presence of co-morbidities	167	54.2	
Drink alcohol regularly	59	17.5	
(n=344)	37	17.5	
Drink alcohol during the	9	2.8	
epidemic (344)			
Usual smokers (n=344)	49	14.3	
Smoke tobacco during the epidemic (n=344)	33	10.5	



Fig. 1. Total KAP score distribution of respondents.

The KAP scores of the respondents are presented in Fig. 1. On assessing the knowledge of COVID-19, the mean knowledge was 5.6 (SD=1.95) out of a total of 13 points translated to 43%. Only half (52.2%) of respondents were found with good knowledge. The most known symptoms were cough (62.8%), difficulty in breathing (50.1%) followed by fever (40.5%). Only 20.2% of patients identified sore throat as a symptom of COVID-19. Only a few participants (10.4%) knew loss of smell and body pain (9.0%) as symptoms. Majority of the respondents (78.9%) had good knowledge on; "smokers who get COVID-19 are more likely to get ill than non-smokers". More than two thirds (68.5%) of them knew that "most people who get COVID-19 do not become very ill". Just under two thirds (62.4%) of study subjects agreed with "one can be infected with the virus without any symptoms". Just over half (53.7% and 50.2%) knew that "children get less ill from the virus than adults" and "not only the elderly would die from COVID-19" respectively. The findings of this study demonstrated poor knowledge on the survival of the virus for days outside the body on plastic surfaces (45%) and that the virus can survive outside the body for up to 7 days (39.8%).

The mean score for attitudes was 2.7 (SD=1.67) out of a total of 5 that translates to 54%. The positive attitudes (> 50%) were found among 58.6% of the respondents. The majority (70.6%) of the subjects did not think that COVID-19 would cause a serious infection. Just under two thirds (63.1%) were confident that the health facility can handle the COVID-19 pandemic and 61.9% think that they might get infection with the virus. Under half (48.3%) of them thought that the South African Government would be able to handle the epidemic whilst only 26.5% thought that the KCHC would have sufficient medical supplies to handle the epidemic.

The respondents of this study practiced preventive behavior with a mean practice score of 5 (SD=1.2) out of a total of 6 points translated to 83.3%. Nearly all (95.4%) were practicing preventive practices. The majority (93%) of the respondents would not visit a friend or a relative who would be COVID-19 positive, 86.5% would not visit a family or a friend during the COVID-19 epidemic, 85% would wash or sanitize their hands when coming home from outside, 81.8% used a face mask in public places, 79.7% were maintaining social distance in public places and 79.1% were covering their mouths when sneezing or coughing.

Table II depicted the relationship between KAP scores and showed that knowledge was fairly positively correlated with practice (r=0.173, p<0.05). Attitude had no significant correlation with knowledge and practice scores (p>0.05).

When comparing the overall knowledge, attitudes and practice scores related to demographic variables using the students t-test and ANOVA test, it was found that the mean knowledge score was significantly higher as the ages of the respondents were increased (p<0.05) (Table III). Unemployed respondents were shown to have significantly higher mean knowledge score (p<0.05).

Smokers had a significantly higher mean knowledge score than non-smokers (p<0.05). Gender and the presence of vulnerable comorbidity were related to significant practice mean differences. Males had significantly higher mean preventive practice score than females (p<0.05). Respondents

with comorbidities were found with significantly higher mean practice score (p<0.05) and higher (positive) attitude mean (p<0.05) towards COVID-19 epidemic.

TABLE II: PEARSON CORRELATION OUTCOME AMONG FINAL SCORES OF

		Total attitude	Final knowledge score	Final Score Practice
Total	Pearson Correlation	1	.047	.072
attitude	Sig. (2-tailed)		.388	.183
	N	345	345	345
Final	Pearson Correlation	.047	1	.173**
knowledge	Sig. (2-tailed)	.388		.001
score N	N	345	345	345
Final Score	Pearson Correlation	.072	.173**	1
Practice Sig. (2-tailed)	.183	.001		
	N	345	345	345

<sup>\*\*.</sup> Correlation is significant at the 0.01 level (2-tailed).

TABLE III: COMPARISON OF THE MEAN KNOWLEDGE, ATTITUDE AND PRACTICE WITH REGARDS TO DEMOGRAPHIC VARIABLES OF THE

	RESPONDENTS USING T- TEST A  Variables		Mean	P- value	
Knowledge					
	< 25 years	47	2.87		
	25 - 34 years	103	3.74		
Age	35 to 44 years	67	3.71	0.001	
· ·	45 to 54 years	41	3.56		
	55 years and above	68	3.14		
Employment status	Full- time	99	2.49		
	Part- time	49	2.47	0.011	
	Unemployment	186	2.81		
Smoking during	No	282	3.43	0.010	
pandemic	Yes	33	4.09	0.010	
Practice					
Gender	Male	168	2.85	0.022	
	Female	175	2.51	0.032	
	None	158	4.77	0.005	
Comorbidity	Present	186	5.17	0.005	
Attitude					
Comorbidity	None	158	2.42	0.007	
•	Present	186	2.91	0.007	

Multiple regression analysis output showed that respondents of older ages (35-44 years and 45-54 years) were 2.8 times and 5.7 times more likely to have good knowledge (OR=2.8, 95% CI; 1.2:6.7, p<0.05 and OR =5.7, 95% CI; 2.0:16.4, p<0.05) respectively (Table IV).

TABLE IV: BINARY LOGISTIC ANALYSIS OUTPUT FOR GOOD KNOWLEDGE

OF THE RESPONDENTS				
Variables	Sig.	Odds Ratio	95% C.I for OR	
		(OR)	Lower	Upper
Age category	.005			
Age < 25 years	.478	1.499	.490	4.583
Age 25-34 years	.553	1.279	.567	2.884
Age 35-44 years	.015	2.872	1.224	6.738
Age 45-54 years	.001	5.730	2.001	16.408
Currently not smoking tobacco	.003	.219	.081	.593
Absence of co-morbidity	.031	.503	.269	.940
Constant	.021	3.206		

Non-smokers were 79% less likely to have good knowledge as OR=.219, 95% CI; .081:.593, p<0.05. Respondents with no comorbidity were 50% less likely to have good knowledge (OR=.503, 95% CI; .26:.94, p <0.05). Respondent with no education was found to be 7 times more likely to have negative attitudes towards COVID-19 epidemic (OR =7.3, 95% CI; 1.2:42.8, p <0.05)

(Table V). There was no demographic variable found as a predictor of good practice (data not shown).

TABLE V: BINARY LOGISTIC ANALYSIS OUTPUT FOR POOR ATTITUDE

Variables	Sig.	Odds Ratio	95% C.I. for OR	
		(OR)	Lower	Upper
Level of education	.112			
No education	.026	7.39	1.27	42.86
1-5 years schooling	.361	1.70	.54	5.32
6-11 years schooling	.252	1.70	.68	4.26
12 years Matric completed	.931	1.04	.42	2.51
Currently smoke tobacco (1)	.094	2.18	.87	5.48
Constant	.238	.51		

## IV. DISCUSSION

This study provides an insight on the level of personal knowledge, attitudes, and preventive practices to deal with coronavirus infection, transmission and prevention among the general people attending KCHC at the time of the COVID-19 pandemic and national lockdown in SA. To date, there has been limited published data on the KAP of the general population towards COVID-19 in SA. This study is unique because it was undertaken in a PHC facility in SA to describe the KAP gap to identify and implement programs to better protect the communities of rural areas.

The demographic indicators such as low level of education and being unemployed (54.5%) reflect poor socioeconomic status. More than half (51.5%) of the participants had vulnerable comorbidities for COVID-19. According to the reported data, it is indicated that HIV and hypertension are the most common comorbidities in SA [3]. Therefore, utmost care and protection must be provided for these vulnerable groups, at home and when they attend KCHC. Strategies undertaken at KCHC include the dispensing of medication for a period of 3 months, rather than one, which was the norm. Furthermore, a priority queue was introduced during the epidemic period by the directive of National and provincial health authorities to render a faster service.

A good percentage (84%) of the respondents had reduced alcohol consumption from 17.2% (before the epidemic) to 2.8% during the epidemic, and this may be attributed to the ban on the sale of alcohol and tobacco during the national lockdown in SA. Similarly, a moderate reduction of 26% of smoking from 14.3% to 10.5% was found among these respondents. [16]. However, the reduction of smoking behavior may not have been as desired, as it was reported that cigarettes were still available due to the illegal trading during the ban [20]. Importantly, cigarette smokers are rendered vulnerable and at a higher risk for COVID-19.

In the absence of a COVID-19 vaccine, preventive measures play an integral role in reducing person-to-person transmission thereby controlling the spread of the disease in the general population [21]. The pandemic poses a major health problem to the population at large, with higher mortality and morbidity in the vulnerable groups, and this includes people with existing comorbidities. Adequate knowledge is regarded as being crucial for the better establishment of preventive belief and for the development of positive attitudes and practices whilst inadequate knowledge poses a higher risk of infection [22], [23].

The present study found poor level of knowledge about COVID-19 among the PHC attendees from a community in SA. Higher levels of knowledge regarding COVID-19 were found in studies conducted in other parts of Africa. For example, a study of PHC facility users from Nigeria reported a higher level of knowledge. [24] Another study conducted in Ethiopia among the general population found higher levels of knowledge about COVID-19 [25]. The poor knowledge of our populations on COVID-19 among the participant from a rural poor socio-economic condition is expected, because this epidemiological survey was conducted during the early stages of the epidemic in SA and amongst respondents who had a low level of education (only 14% had tertiary education) compared to the subjects of Nigerian study (54%) [24]. These factors are known to hinder the gaining of proper and adequate knowledge [26]. Education, age, and income had been documented to be highly relevant to knowledge [21]. The difference could also partly be attributed to the timing of our study, as this study was undertaken during the early stages of the COVID-19 epidemic SA, where difficulty in accessing and obtaining true and timeous information was probable and differences in demographic and socio-economic status.

About a third of the participants in this study knew that COVID-19 infection does not make someone very sick and only 41.5% knew about the survival of the virus outside the body. The findings in our study indicate that most of the participants had extremely poor knowledge on the survival of the virus. During this early stage of the pandemic in SA, enough knowledge on the symptoms of COVID-19 were readily available, but little was known to the general population of the survival and transmission of the virus.

The present study found that most of the participants had good attitudes towards COVID-19. It was very surprising to see that 27% of the participants thought that KCHC would have adequate medical supplies to handle the epidemic and less than half believed that SA Government can handle the COVID-19 pandemic. The lack of trust in the South African government and healthcare facilities could be a result of anxiety within the general population. There is a possibility that a substantial proportion of the general population become anxious and paranoid during a pandemic. Stress, rumors, and exhaustion of available resources occur with further misconceptions in the media and social platforms which contributes to the negative attitudes experienced by the general population in South Africa [27].

In this study, no significant relationship was found between knowledge and attitudes regarding COVID-19. This finding is not consistent with findings in other studies on KAP of COVID-19 in other parts of Africa and internationally where a significant relationship between knowledge and attitude towards COVID-19 exists amongst the general population [28]-[31]. This could be probable due to the implementation of regulation such as the national lockdown which lead to home quarantine, banning on sale of alcohol and tobacco products, and social distancing.

Preventive practices towards COVID-19 were found to be good among the participants. This was possible as stricter rules and regulations were imposed, implemented, and monitored by the Government of SA. The wearing of face masks, social distancing and washing of hands with sanitizer became mandatory at all public places and were monitored by the SA government agencies.

Smokers had better mean knowledge of COVID-19 than non-smokers. There are numerous research reports described the adverse consequences of COVID-19 on the health of people who smoke. A survey conducted in Cape Town, SA [16] showed that cigarettes were still very accessible to the public. A possible explanation for smokers having a higher mean knowledge than people who do not smoke could be that such individuals who continued to smoke during the lockdown when cigarettes were banned wanted to educate themselves to prevent the risk of infection and transmission of COVID-19.

Our findings showed that the mean knowledge of COVID-19 increased with age. This finding is consistent with findings in other studies conducted in China [21], [32]. It might be due to the reason that older people are at higher risk for complications of COVID-19 and hence familiarize and educate themselves more on the disease. Mean knowledge was also higher in unemployed people. Another possible explanation could be that those individuals who are unemployed had more time to spare and acquire knowledge on COVID-19 via television, newspapers, and other media platforms. A similar trend of knowledge was reported elsewhere [33] which showed that knowledge of COVID-19 was high in a low income setting where majority of participants were unemployed.

Furthermore, our findings in this study indicate that patients with no education were seven times more likely to have a negative attitude towards COVID-19. This is consistent and comparable with other studies in abroad which revealed that those that attained higher education were significantly more likely to have positive attitudes, and preventive practice towards COVID-19 [24], [25].

The findings from this study are useful for public health policymakers and health workers to recognize target population for COVID-19 prevention and health education. These findings further suggest that the health education intervention would be more effective if it targets the identified demographic, geographic groups. implementation of national regulations ensuring positive practices of people also found to work positively for prevention of epidemic, for example, the COVID-19 knowledge may be greatly increased if the health education programs are specifically designed.

# V. CONCLUSION

The results revealed that patients at public primary healthcare facilities from a rural black community, demonstrated poor knowledge, positive attitude, and very good preventive practices about COVID-19. Participants with higher level of education were found with positive attitudes. Based on these findings, we recommend public health education programs on COVID-19 should be targeted at individuals with low knowledge level, lower educational attainment, and that more efforts are needed for residents of the Kwadabeka and similar rural communities of SA. Implementation of national regulations towards healthy practices may enhance the right attitude and the adoption of unharmful COVID-19 related practices which are necessary mitigating the impact of COVID-19 on the target population.

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