

Original Research Article

Knowledge, attitudes and practices towards COVID-19 among Residence in Mombasa County, Kenya

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Received: 20 July 2022

Revised: 09 October 2022

Accepted: 09 December 2022

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ABSTRACT

Background: Infectious disease pandemic of COVID-19 continues to be a global & public health challenge. The knowledge, attitudes and practices of the people towards COVID-19 is critical to the understanding the epidemiological dynamics of the disease. This study sought to assess the awareness of Knowledge, attitudes and practices towards COVID-19.

Methods: A cross-sectional quantitative survey was conducted in Mombasa between September-October, 2020. A validated questionnaire was used to collect data. Data collected were analysed using analysis of variance (ANOVA), and Pearson's correlation and multivariate linear regression tests. A total of 422 participants completed the survey questionnaire. A $p < 0.05$ was statistically significant.

Results: The mean age was 29.55 years (SD: 10.7), 252 (59.72%) were female, and 170 (40.28%) were male. Majority 255 (60.4%) were aged between 18-29 years while 200 (47.38%) and 162 (38.39%) were educated up to secondary and university level respectively. Knowledge scores significantly differed across genders, age-groups, categories of marital status, education levels ($p < 0.05$). The mean COVID-19 knowledge score was 7.45 (SD: 1.51), suggesting an overall 62% ($7.45/12 \times 100$) correct rate on this knowledge test. The majority of the respondents agreed that COVID-19 will finally be successfully controlled (66.35%) and this was significant ($p < 0.05$). The vast majority of the participants had not visited any crowded place (88.35%) and wore masks when going out (74.31%) in recent days.

Conclusions: The knowledge about COVID-19 in the Mombasa County population during the outbreak was acceptable, attitudes have been mostly favourable and the practices are mostly adequate.

Keywords: COVID-19, Knowledge, Attitudes, Practices, Kenya

INTRODUCTION

COVID-19 was first reported by the World Health Organization on the 31st December 2019 in Wuhan city, China and announced as a global pandemic. The contagious virus began its ravaging effect in Wuhan,

Hubei Province, China and then around the world.^{18,20} So far, the disease is characterized by high morbidity and mortality rates alongside other ailments.¹⁴ The shutting down of social activities throughout the world to mitigate the spread of the pandemic has led to a global lockdown, causing a downturn and global economic fall due to a

break in the global supply chain.⁷ In Kenya, the Ministry of Health confirmed the first coronavirus case on March 12, 2020. Despite the containment measures put in place, the number of Covid-19 cases and deaths steadily increased. By end of February 2021, Kenya had 105,201 cases, 1,824 deaths and 85,775 recoveries (MOH, 2021). In Mombasa County, 60% of the people live in overcrowded informal settlements in form of shelters. The presence of urban slums and dense populations causing implementation public health measures necessary for curbing of coronavirus impossible.¹⁹ To guarantee the final success, people's adherence to these control measures are essential, which is largely affected by their knowledge, attitudes, and practices (KAP) towards COVID-19 in accordance with KAP theory.¹¹ There are however limited studies in sub-Saharan Africa and globally, reporting knowledge, attitudes, and practices (KAPs) of residence towards COVID-19. The objective of the study is to explore the KAP towards COVID-19 and homoeopathy in the citizens of Mombasa County during its rapid upsurge. The findings of the study shall provide an insight when designing future interventions to promote specific messages to enhance knowledge, change attitude and improve practice regarding COVID-19.

METHODS

Study site

The study was conducted in Mombasa County which has a population of 1,600,266 by the year 2018. The total area of Mombasa is 109 km².

Study design

A descriptive cross-sectional survey using quantitative techniques was conducted in September to October 2020.

Study population

The study population comprised of residents of Mombasa County between the ages of 18 and above years.

Inclusion criteria

All males and females of 18 years and above consented to participate in the study.

$$n = Z^2 P \frac{a/2P(1-P)}{d^2}$$

Sample size estimation

Sample size estimation was done using the formula by Fischer et al (1998) at 95% confidence interval and a prevalence of 50% because the exact proportion of Mombasa County Prevalence of covid is not well known. 10% was added to take care of non-respondents hence the total was 422.

Data collection techniques

A pilot study was carried out with 10% of the sample size in Kilifi County, with which a Cronbach's Alpha of 0.8 was obtained. A pre-tested questionnaire was applied to participants who consented to the study drawn from all the study sites. The questionnaire was developed according to the guidelines for the community of COVID-19, by the Center for Disease Control and Prevention and World Health Organization.

Data management and analysis

Questionnaires were entered into Microsoft Excel 2016. Independent variables were summarized as frequencies and percentages. t-test and one-way analysis of variance (ANOVA) compared medians and means respectively. Multivariable linear regression analysis using all of the demographic variables as independent variables and knowledge score as the outcome variable was conducted to identify factors associated with knowledge. Similarly, binary logistic regression analyses were used to identify factors associated with attitudes and practices. Unstandardized regression coefficients (β) and odds ratios (ORs) and their 95% confidence intervals (CIs) were used to quantify the associations between variables and KAP. A $p < 0.05$ was considered statistically significant.

RESULTS

Social-demographic characteristics

A total of 422 participants completed the survey questionnaire. The mean age was 29.55 years (SD: 7.4), 252 (59.72%) were female and 170 (40.28%) males. The mean COVID-19 knowledge score was 7.45 (SD: 1.51), suggesting an overall 62% ($7.45/12 \times 100$) correct rate on this knowledge test. Knowledge scores significantly differed across genders, age-groups, categories of marital status, education levels, and residence places ($p < 0.001$) (Table 1).

Table 1: Demographic characteristics of participants and knowledge score of COVID-19 by demographic variables (n=422).

Characteristic		Number of participants (%)	Knowledge score (Mean $\pm$ standard deviation)	t/f	P value
Gender	Male	170 (40.28)	7.30 $\pm$ 1.72	3.82	<0.001
	Female	252 (59.72)	7.53 $\pm$ 1.40		
Age-group	18-29	255 (60.43)	7.51 $\pm$ 1.32	3.37	<0.001

Continued.

Characteristic		Number of participants (%)	Knowledge score (Mean $\pm$ standard deviation)	t/f	P value
(years)	30-49	140 (33.17)	7.37 $\pm$ 1.77		
	≥ 50	27 (6.400)	7.38 $\pm$ 1.72		
Marital status	Never-married	270 (64.00)	7.53 $\pm$ 1.32	12.77	<0.001
	Married	102 (24.17)	7.40 $\pm$ 1.75		
	Other*	50 (11.83)	7.07 $\pm$ 1.98		
Education	None	5 (1.2)	4.00 $\pm$ 4.89	107.13	<0.001
	Primary	55 (13.03)	4.53 $\pm$ 3.19		
	Secondary	200 (47.38)	7.31 $\pm$ 1.92		
	University/College	162 (38.39)	7.55 $\pm$ 1.24		
Occupation	Students	160 (37.91)	7.49 $\pm$ 1.39	13.07	<0.001
	Employed	100 (23.700)	7.52 $\pm$ 1.55		
	Self employed	50 (11.84)	7.31 $\pm$ 1.26		
	Unemployed	112 (26.54)	6.78 $\pm$ 2.10		

*"Others" included re-married, co-habiting, separated, divorced, and widowed.

Table 2: COVID-19 related knowledge among residence in Mombasa County, Kenya (n=422).

Question	Frequency	%
Who do you think is at risk of getting COVID-19?		
Everyone	370	87.7
Adults	40	9.50
I Don't know	12	2.8
Who do you think is at high risk for severe illness of COVID-19?		
Adults (40+ years)	207	49.0
Everyone	75	17.7
People with other diseases	75	17.7
I don't know	48	11.5
Adults (18-40 years)	10	2.4
Children	7	1.7
How long does it take for apers on with COVID-19 to develop symptoms?		
5-14 days	150	35.6
I don't know	102	24.2
14+ days	100	23.7
2-5 days	50	11.8
One day	20	4.7
Does COVID-19 have an approved vaccine?		
No	280	66.4
I don't know	100	23.7
Maybe	22	5.2
Yes	20	4.7
Does COVID-19 have a cure?		
No	200	47.4
Yes	102	24.2
Maybe	70	16.6
I don't know	50	11.8
What is the recommended social distance?		
4 meters	180	42.6
2 meters	150	35.6
1 meter	75	17.7
3 meters	17	4.1

Knowledge

Table 2 shows responses of the participants to questions about knowledge on COVID-19. The majority (87.7%, n=370) of the participants reported that everyone was at risk of getting COVID-19 and one-third (49.0%, n=207) reported that people of age ≥ 45 years and those with other diseases were at the highest risk of severe illness of COVID-19. Only 66.4% and 47.4% knew that COVID-19 did not currently have a vaccine nor a cure, respectively. Multiple linear regression analysis showed that male

gender (verses female, β : -0.283, $p < 0.001$), age-group of 18-29 years (vs. 30-49 years β : -0.101, $p < 0.001$), marital status of married (verses other, β : -0.370, $p < 0.001$), Education of secondary (verses University, β : 3.346, $p < 0.001$) were significantly associated with knowledge. At Fisher's Exact test analysis, marital status was significantly associated with knowledge ($p = 0.020$) but this lost significance at logistic regression married (OR=1.2, 95% CI: 0.5-2.8; $p = 0.695$); and divorced (OR=0.11, 95% CI: 0.01-1.1; $p = 0.06$); with patients who have never married as there reference (Table 3).

Table 3: Results of multiple linear regressions on factors associated with poor COVID-19 knowledge.

Characteristic	Coefficient	Standard error	t	P value
Gender (male verses female)	-0.283	0.055	5.07	0.001
Age-group (18-29 verses 30-49)	-0.101	0.754	-1.3	0.001
Age-group (30-49 verses ≥ 50)	0.632	0.128	0.49	0.623
MaritalStatus (never married verses married)	-0.586	0.076	-0.77	0.443
Marital status (married verses others)	-0.370	0.925	-4.00	0.001
Education (primary verses secondary)	0.711	0.379	1.88	0.061
Education (secondary verses university)	3.346	0.321	10.42	0.001
Education (primary verses university)	3.489	0.313	11.13	0.001
Occupation (students verses employed)	0.130	0.702	1.86	0.063
Occupation (students verses self-employed)	-0.089	0.116	-0.77	0.444

Table 4: Attitudes towards COVID-19 by demographic variables.

Characteristic		Attitudes, n (%) or mean (standard deviation)				
		Final success in controlling			Confidence of winning	
		Agree	Disagree	Don't know	Yes	No
Gender	Male	115 (67.65)	35 (20.58)	20 (11.76)	145 (85.29)	25 (14.71)
	Female	165 (65.47)	15 (5.95)	72 (28.57)*	222 (88.09)	30 (11.90)*
Age-group (years)	18-29	167 (65.49)	20 (7.84)	68 (26.67)	218 (85.49)	37 (14.50)
	30-29	90 (64.28)	9 (6.43)	41 (29.29)	123 (87.86)	17 (12.14)
	≥ 50	22 (81.48)	1 (3.70)	4 (14.81)*	26 (96.29)	1 (3.71)*
Marital status	Never married	173 (64.07)	18 (6.67)	79 (29.26)	232 (85.93)	38 (14.07)
	Married	71 (64.07)	6 (5.88)	25 (24.51)	90 (88.24)	12 (11.76)
	Other	34 (68.00)	5 (10.00)	11 (22.00)**	43 (86.00)	7 (14.00)*
Education	None	1 (20.00)	0 (0)	4 (80.00)	4 (80.00)	1 (20.00)
	Primary	29 (52.73)	3 (5.46)	23 (41.81)	40 (72.73)	15 (27.27)
	Secondary	150 (75.00)	7 (3.50)	43 (21.50)	176 (88.00)	24 (12.00)
	University	106 (65.43)	12 (7.41)	44 (27.16)*	141 (87.03)	21 (12.96)*
Occupation	Students	103 (64.37)	12 (7.00)	45 (28.12)	139 (86.88)	21 (13.12)
	Employed	66 (66.00)	6 (66.00)	28 (28.00)	86 (86.00)	14 (14.00)
	Self employed	35 (70.00)	4 (8.00)	11 (22.00)	46 (92.00)	4 (8.00)
	Unemployed	82 (73.21)	4 (3.57)	26 (23.21)*	99 (88.39)	13 (11.60)*
COVID-19 knowledge score		7.62 (1.15)	7.40 (1.38)	7.06 (2.12)***	7.51 (1.37)	7.10 (2.18)***

* $p < 0.05$, ** $p = 0.01$, *** $p < 0.001$

Table 5: Results of multiple binary logistic regression analysis on factors significantly associated with attitudes towards COVID-19.

Characteristic	OR (95% CI)	P value
Disagree with final success (verses agree)		
Gender (male verses female)	1.50 (0.40-0.63)	0.000
Age-group (18-29 verses 30-49)	0.78 (0.62-0.98)	0.000
COVID-19 knowledge score	0.78 (0.74-0.83)	0.000
No confidence of winning		
Gender (male verses female)	1.31 (1.05-1.63)	0.000
Age-group (18-29 verses 30-49)	1.55 (1.25-1.92)	0.000
COVID-19 knowledge score	1.18 (1.10-1.26)	0.000

Table 6: Practices toward COVID -19 demographic variables.

Characteristics		Practices, N (%) or mean (standard deviation)			
		Going to crowded place		Wearing a mask	
		Yes	No	Yes	No
Gender	Male	28 (16.47)	142 (83.52)	44 (25.88)	126 (74.12)
	Female	23 (9.13)	229 (90.87)**	67 (26.59)	185 (73.41)***
Age-group (years)	18-29	30 (11.77)	225 (88.23)	65 (25.49)	190 (74.50)
	30-49	15 (10.71)	125 (89.29)	39 (27.85)	101 (72.14)
	≥50	4 (14.81)	23 (85.19)*	2 (7.41) *	25 (92.59) ***
Marital status	Never- married	35 (12.96)	235 (87.04)	65 (24.07)	205 (75.93)
	Married	12 (11.77)	90 (88.23)	27 (26.47)	75 (73.53)
	Others	9 (18.00)	41(82.00)*	12 (24.00)	38 (76.00) ***
Education	None	2 (40.00)	3 (60.00)	2 (40.00)	3 (60.00)
	Primary	23 (41.82)	32 (58.18)	18 (32.73)	37 (67.27)
	Secondary	24 (12.00)	176 (88.00)	50 (25.00)	150 (75.00)
	University	17 (10.49)	145 (89.51)**	41 (25.31)	121 (74.69)***
Occupation	Students	20 (12.50)	140 (87.50)	40 (25.00)	120 (75.00)
	Employed	13 (13.00)	87 (87.00)	26 (26.00)	74 (74.00)
	Self-employed	4 (8.00)	46 (92.00)	14 (28.57)	36 (71.43)
COVID-19 knowledge score		6.83(2.68)	7.54 (1.26)**	7.64 (1.71)	7.39 (1.43)***

*p<0.05, **p<0.01, ***p<0.001

Table 7: Results of multiple binary logistic regression analysis on factors Significantly associated with practices towards COVID-19.

Characteristic	OR (95% CI)	P value
Going to a crowded place		
Gender (male verses female)	0.53 (0.42-0.67)	0.000
Age-group (18-29 verses30-49 years)	0.68 (0.55-0.85)	0.001
Marital status (never-married verses married)	1.34) (1.12-1.60)	0.001
COVID-19 knowledge score	0.81 (0.76-0.87)	0.000
Not wearing a mask		
Gender (male verses female)	1.01 (0.85-1.21)	0.000
Age-group (18-29 verses30-49)	0.80 (0.68-0.93)	0.000
COVID-19 knowledge score	1.13 (1.06-1.20)	0.000

Attitudes towards COVID-19

The majority of the participants had a good attitude towards the authenticity of COVID-19 tests. Most of the respondents agreed that COVID-19 will finally be

successfully controlled (66.35%). Rates of reporting “disagree” and “I don't know” were 11.85% and 21.80%, respectively. Statistically significant differences were found between attitudes and gender, age-group, marital status, education, occupation and COVID-19 knowledge

score. In additions, respondents reporting “disagree” and “I don’t know” had significantly lower knowledge scores than those reporting “agree” ($p < 0.001$) (Table 4).

Multiple logistic regression analysis found that male gender (versesfemale OR=1.50,95% CI: 0.40-0.63; $p=0.000$), and COVID-19 knowledge score (OR: 0.78, 95% CI: 0.74-0.83; $p=0.000$) were significantly associated with disagreement on the final success in controlling the disease. Female gender (versesmale OR= 1.3, 95% CI: 1.05-1.63; $p=0.000$), age-groups of 18-29 (verses30 -49, OR=1.55, 95% CI: 1.25-1.92; $p=0.000$) and COVID-19 knowledge score (OR=1.18, 95% CI: 1.10-1.26; $p=0.000$) were significantly associated with the with disagreement on the final success in controlling the disease. Gender (male vs female OR: 1.3 95% CI: 1.05-1.63; $p < 0.001$; $p < 0.001$) and COVID-19 knowledge score (OR: 1.18,95% CI: 1.10-1.26; $p < 0.001$) were significantly associated with no confidence of winning (Table 5).

Practices towards COVID-19

The vast majority of the participants had not visited any crowded place (87.91%) and wore masks when going out (73.7%) in recent days. Statistically significant differences were found between practices and gender, age-group, marital status, education, occupation, place of current residence and COVID-19 knowledge score ($p < 0.05$). There was still a small portion of the participants who had visited crowded places (25.6%) and had not worn masks when leaving home (26.2%) recently (Table 6).

Multiple logistic regression analysis found that male gender (versesfemale OR=0.53,95% CI: 0.42-0.67, $p=0.000$), age-group 18-20 (verses30 -49, OR=0.68, 95% CI: 0.55-0.85; $p=0.001$), and COVID-19 knowledge score (OR=0.81, 95% CI: 0.76-0.87; $p=0.000$) were significantly associated with going to any crowded place. Male gender (versesfemale, OR= 1.01, 95% CI: 0.85-1.2; $p=0.000$), and COVID-19 knowledge score (OR= 1.13, 95% CI: 1.06-1.20; $p=0.000$), were significantly associated with not wearing a mask outside. The rates of these two practices significantly differed across demographic groups ($p < 0.05$) as shown in Table 7.

DISCUSSION

This study was dominated by female (59.7%) and single (64.0%) respondents who were mostly educated up to secondary level (47.4%) with an overall 62.0% awareness of COVID-19 thus, depicting that the respondents are knowledgeable about COVID-19 pandemic.

From our study, the mean knowledge score on COVID-19 in all groups was similar; however, it was observed that in all cases there was a statistically significant difference between the knowledge score on COVID-19 and gender, the age group, the marital status, education and occupation. The findings are also in agreement with our

findings. Previous studies conducted in different Asian countries.^{3,8,15,19} Egypt, Kenya and Nigeria indicated high COVID- 19 knowledge among the population.^{1,12} However, it is in contrast to the study done In Addis Zemen Hospital, Northwest Ethiopia which showed a high prevalence of poor Knowledge among chronic diseases patients.² This could be due to the reason that the country was from a nation-wide lockdown and the Ministry of Health educative messages on COVID-19 that were disseminated country wide during the lockdown. It is important to note that knowledge about infection control can be a predictor of good practice and its inadequacy could result in uncertainties and non-stringent control measures. The high level of COVID-19 knowledge recorded in this study could be attributed to the caliber of respondents who participated in the study.

The vast majority of attitudes were favorable when it came to successfully controlling COVID-19 and winning the battle, however, it is striking that a proportion of the respondents do not know if the virus was successfully controlled. Another interesting proportion considers that Kenya did not win the battle to COVID-19, which can be attributed to false information distributed by social networks, due to the fear and anxiety that exists in these cases, which can be mitigated by a culture of proper use of information. The majority of the respondents agreed that COVID-19 will finally be successfully controlled (66.35%). Only one-third of them reported that the government is handling the pandemic well. It was expected that majority of them would be optimists to the attitude questions because it has been a considerable time since the pandemic was declared. However, limited resources (personal protective equipment (PPE)) are available in the market to prevent the pandemic; it could be why the participants have an unfavorable attitude.

Our findings are consistent with some study’s other studies where majority of the participants agreed COVID-19 would finally be controlled, expressed confidence that their country will win the battle against COVID-19, and their government is doing well to control the pandemic.^{13,14,16,18} Our findings showed that high levels of educational and good knowledge scores were significantly associated with a favorable attitude towards the pandemic. It is consistent with the study done in China, India and Malaysia.^{7,5,11} Participants education and knowledge are crucial to having a favorable attitude and preventing the perpetuation of the pandemic.⁶

From our study, most of the participants reported not having gone to places of mass attendance. The risk found between “going to a crowded place” and demographic variables was low, while the risk found between going “without wearing a mask” was 1.01 times more in men than in women. Other studies also had a similar result.²⁰

The vast majority of the participants had not visited any crowded place (87.91%) and wore masks when going out (73.7%) in recent days. It is inconsistent with studies

done in Malaysia where the practice was not impressive where only half (51.2%) of the total participants used face mask when leaving home.³ It is consistent with studies done in Tanzania where 77%, and 80% avoided crowds and wore face masks; in India where the majority of participants take preventive measures; in China 96.4% and 98% avoided crowding and used a face mask; in Nepal where 94.9%, 88.2%, and 93.7% avoided crowded, appropriately used a face mask, and took preventive measures.^{4,9,17} In Malaysia where 83.4% and 87.8% avoided crowding and took precautionary measures, respectively.³

Awareness about COVID-19 was significantly associated with COVID-19 related practices. This could be due to the fact that COVID-19 related practices are practiced after being aware of the disease and the activities themselves. It is also worth noting that, from this study, majority of the participants reported that it was not difficult to follow the stipulated COVID-19 preventive measures (hand washing, staying home or wearing face masks) which could as well explain the adequate practicing of the measures by the participants.

Our study has some important limitations that should be considered while interpreting the findings of the study. Our study reports perceived practices rather than observed responses. Strict enforcement of COVID-19 guidelines at the time of the study therefore might have influenced some participants to give socially acceptable responses.

CONCLUSION

A number of the participants had knowledge and adhered to practices related to COVID-19 prevention methods. Approximately three quarters of the participants agreed that Kenya would win the battle against the pandemic, and it will finally be controlled. But only a third felt that the government is handling the pandemic well. Gender, age, and educational status were significant predictors of knowledge score. Educational status and knowledge scores were significantly associated with attitudes and practices towards COVID-19. However, with the lifting and relaxation of the extreme preventive measures like lock downs, continuous public education is recommended. Provision of hand washing facilities and personal protective equipment like face masks to the community are recommended.

ACKNOWLEDGEMENTS

All authors have interest on public health, emerging infectious diseases and disease control. They have over the years worked on HIV/AIDS, rabies, Cholera among other infections. We acknowledge Dr. Abbas Ali Shamsudin for reviewing the study protocol and guiding us towards the happening of this study. We also appreciate Collaboration of Women Development

(CWID) an NGO in Mombasa County for helping us with collection of data.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Yonge SA, Opiyo BO, Bakari BA, Shamsudin AA, Sharma RR, Sharon B. Knowledge, attitudes and practices towards COVID-19 among Residence in Mombasa County, Kenya. *Int J Community Med Public Health* 2024;11:2563-70.