Barriers and Facilitators to COVID-19 Vaccine Uptake Among the Elderly

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Abstract-
Introduction:
Globally as of 23rd October 2023,13.5 billion doses of COVID-19 vaccine had been administered. In Africa, it is estimated that 51.8% of the total population was vaccinated while in Kenya only 27% of the eligible population was fully vaccinated. Vaccination is the mainstay of healthcare policy and a crucial element in preventing infectious diseases. The study aimed to determine the barriers and facilitators to COVID-19 vaccine uptake among the elderly.

Study Objective: To identify the barriers and facilitators to COVID-19 vaccine uptake among the elderly in Kiambu County.

Methodology: A community-based cross-sectional study was undertaken in several sub-counties in Kiambu County. A multistage cluster sampling method was used to recruit 423 participants for this study. The participants were given informed consent. An interviewer-administered questionnaire and key informant interviews were used to collect data. Multivariate logistic regression was used to determine the predictors of COVID-19 vaccine uptake among the elderly.

Results: In total, 423 participants aged 60 years and above were considered in this study, 58.6% were female. Most of the participants (90%) were aware of the COVID-19 vaccine. The level of uptake of COVID-19 vaccine was 55.8%. The most common reason for taking up the vaccine was because it was free (84.3%). The statistically significant facilitators were fear of getting COVID-19, OR 0.234(95% 0.056-0.974, p-value 0.046), trusting that the COVID-19 vaccine is effective OR 0.131 (95% 0.031-0.553, p-value 0.006), being not afraid of side effects of the vaccine OR 6.872 (95% 3.651-12.938 p-value 0.000), and believing that the vaccine is safe OR 0.098 (95% 0.024-0.398, p-value 0.001). The barriers to COVID-19 vaccine uptake were, that vaccinated people were still getting infected (70.1%), having to walk a longer distance to the vaccination center,19 minutes vs 23 minutes, p=0.010 and fear of side effects (p=0.003).

Conclusion: 55.8% of the participants have already received COVID-19 vaccine. The major barriers to COVID-19 vaccine uptake were fear of side effects, restricted access to immunization facilities and vaccine apathy. Perceived severity, perceived susceptibility, and perceived benefits were major facilitators of COVID-19 vaccine uptake.

Indexed Terms- COVID-19 vaccine uptake, elderly, barriers to vaccination, facilitators of vaccine uptake

I. INTRODUCTION

COVID-19 is a major threat globally, 775,481,326 cases have been reported with 7,049,376 mortalities [1]. Individuals older than 60 years old have a higher likelihood of experiencing COVID-19 symptoms [2]. Both non-pharmaceutical and pharmaceutical methods have been used to curb COVID-19 spread. Globally 56% of the population has completed the primary series of COVID-19 vaccine [3], while in Africa only 31.1% of the population is fully vaccinated [4] . Kenya rolled out COVID-19 immunization obtained through the COVAX in March 2021 [5]. The vaccination process was started in phases. Vaccination started with the vulnerable groups which were, health providers, security officers, teachers, old adults above the age of fifty-eight years and adults with co-morbidities [6]. There has been inadequate uptake of the COVID-19 vaccine since its rollout in Kenya. Despite vaccines having been shown to be effective and safe [7]. In Kenya, only twenty-seven percent of the adult population is

fully vaccinated [3].The current study aims to explore the barriers and facilitators to COVID-19 vaccine uptake among the elderly.

II. MATERIALS AND METHODS

The study utilized descriptive cross-sectional study design and it was conducted in Kiambu County, Kenya. The population of the study consisted of people aged sixty years and above. COVID- COVID-19 vaccine uptake among the elderly was the outcome of interest.

A multistage cluster sampling method was utilized. Using a random number generator four sub-counties were selected. Two wards from each of the four sub-counties were randomly selected, giving a total of eight. Simple random sampling was used for the Community Health Units (CHU). All households with elderly above 60 years in the sampled CHU were randomly selected with the help of the respective community health workers.

Using Cochran's 1977 formula, the sample size was calculated with a desired 95% confidence level. The final sample size was 423 after accounting for non-respondents. All participants aged sixty years and above were included in this study. Elderly who were mentally incapacitated like cases of dementia and those severely ill on home-based care were excluded from the study.

Data was collected using interviewer-administered questionnaires that included both open and closed-ended questions. A pilot study was conducted at the Riabai Community Health Unit to test the research instruments.

The Statistical Package for Social Science version (SPSS) program version 26.0 was used for the analysis of data. Coded data was analysed using descriptive analysis, and quantitative methods were employed to measure and explain relationships among variables. Signed consent was sought from all study participants and permission was obtained from relevant authorities including Kiambu County Health Research and Development Unit.

III. RESULTS

Data from 423 participants was analyzed. Majority of respondents ages fell between 60-64 years. There were more females than males (Table 1). Most participants were married, protestants and self-employed.

Socio-Demographic Characteristics	Frequency, n=423	Percent%
Age (Years)		
60-64	172	40.7
64 – 69	138	32.6
Above 70	113	26.7
Gender		
Male	174	41.1
Female	248	58.6
Other	1	0.2
Marital status		
Single	12	2.8
Married	212	50.1
Widowed	188	44.4
Separated	10	2.4
Divorced	1	0.2
Religion		
Catholic	164	38.8
Protestant	252	59.6
Islam	2	0.2
Others	2	0.5
No religion	4	0.9
Employment status		
Government employee	1	0.2
Self-employed	277	65.5
Unemployed	85	20.2
Retired	60	14.2

Table 1: Socio-Demographic Characteristics of the Study Participants

IV. LEVEL OF COVID-19 VACCINE UPTAKE

In this study, 55.8% had received the COVID-19 vaccine, with 28% having received three doses (Table 2)

COVID-19 Vaccine uptake	Frequency, n=423	Percent
Yes	236	55.8
No	187	44.2
Doses received	Frequency	Percent of respondents, n=236
Single dose	61	25.8
Two doses	109	46.2
Three doses	66	28.0

Table 2 level of COVID-19 Vaccine uptake

V. BARRIERS TO COVID-19 VACCINE UPTAKE

The most common reasons given for not receiving the vaccine were the fact that vaccinated people were still getting infected 70.1%, fear of serious side effects 56.1%, feeling that the vaccine is not effective 46.0% and the fact that they did not consider vaccination necessary 39.0% (Table 3).

Variable	Frequency	Percentage %
Reason(s) for not receiving COVID-19 vaccine		
Vaccine not necessary	73	39
Serious side effects	105	56.1
Not effective	86	46
Vaccinated people getting infected	131	70.1
Vaccine not easily accessible	2	1.1

Table 3 description of the population that did not receive the COVID-19 Vaccine

Table 4 is data on obstacles to accessing COVID-19 Vaccine. The most common reasons for inaccessibility were physical limitation 61.8%, distance 34.8% and lack of transportation 25.8% (Table 4).

Variable	%
I cannot go on my own (I have a physical limitation).	61.8
It's too far away.	34.8
I have a medical reason that makes me ineligible to get vaccinated	2.2
I do not have transportation.	25.8
The hours of operation are inconvenient.	0.0
The waiting time is too long.	9.0
It is difficult to find or make an appointment.	5.7
I am too busy to get vaccinated.	1.1
I do not have time off work.	1.1
Not sure	4.5

Table 4 Obstacles to accessing COVID-19 Vaccine

Most participants accessed vaccination stations by foot 48% while 37% accessed by public transport and 13% by motorcycle (Table 5). The least time it took for the sample population to get to the vaccination center was 5 minutes while the most was 90 minutes. The average time for the sample population was 21 minutes.

Access the vaccination stations	n	%
Walking	204	48.2
Public transport (eg matatu)	157	37.1
Motorcycle	57	13.5
Other	5	1.2
Average time in minutes		21

Table 5 access to vaccine stations

VI. FACILITATORS TO VACCINE UPTAKE

The most common reason for taking up the vaccine was because it was free 84.3%, followed by the

influence of the health workers 64.8% and friends 33.9% (Table 6)

Variable	%
Doctor/nurse/community health volunteer	64.8
A friend	33.9
Because it is free	84.3
Others	5.9

Table 6 facilitators to COVID-19 Vaccine uptake

VII. COMPARING BARRIERS AND FACILITATORS TO COVID-19 VACCINE UPTAKE

A comparison was made between the barriers and facilitators to the uptake of the COVID-19 vaccine among the elderly. The association between demographic factors (age, gender, religion, marital status and employment status) and COVID-19 Vaccine uptake was not statistically significant (Table 7). The inability to walk or access public transport (p=0.044) was a significant barrier to the uptake of the COVID-19 vaccine. Having to walk a longer distance to the vaccination center was also a barrier 19 minutes vs 23 minutes, p=0.010.

Variable		Have you received COVID-19 vaccine				
		Yes		No		
		N	%	n	%	p-value
Age	60-64 years	93	54.1	79	45.9	0.715
	65 – 69 years	81	58.7	57	41.3	
	Above 70 years	62	54.9	51	45.1	
Sex	Male	89	51.1	85	48.9	0.151
	Female	147	59.2	101	40.7	
	Other	0	0.0	1	100.0	
Religion	Catholic	98	59.8	66	40.2	0.585
	Protestant	135	53.6	117	46.4	
	Islam	0	0.0	1	100.0	
	Others	1	50.0	1	50.0	
	No religion	2	50.0	2	50.0	
Marital status	Single	7	58.3	5	41.7	0.053
	Married	125	59.0	87	41.0	
	Widowed	94	50.0	94	50.0	
	Separated	9	90.0	1	10.0	
	Divorced	1	100.0	0	0.0	
Employment status	Government employee	1	100.0	0	0.0	0.161
	Self-employed	162	58.5	115	41.5	
	Unemployed	46	54.1	39	45.9	
	Retired	27	45.0	33	55.0	
	Others	0	0.0	0	0.0	
Access to vaccine station	Walking	128	62.7	76	37.3	0.044
	Public transport	80	51	77	49	
	Motorcycle	26	45.6	31	54.4	
	Others	2	40	3	60	

Table 7 barriers to COVID-19 Vaccine uptake

However, several facilitators such as concerns of getting COVID-19, spreading COVID-19 to others, vaccine being safe, vaccine being effective, and vaccine will aid in ending the pandemic were identified (Table 8)

Variable	Yes n (%)	No n (%)	P-value
Perceived susceptibility			
Concerns about getting COVID-19			
No	10(13)	67(87)	<0.0001
Yes	226(65.3)	120(34.7)	
Having chronic illness			
No	34(34.7)	64(65.3)	<0.0001
Yes	202(62.2)	123(37.8)	
I can spread COVID-19 to others			
No	13(15.5)	71(84.5)	<0.0001
Yes	223(66.1)	116(33.9)	
Perceived barrier			
Getting vaccine is painful			
No	218(56)	171(44)	<0.842
Yes	18(52.9)	16(47.1)	
Getting vaccine is time consuming			
No	187(58.3)	134(41.7)	<0.054
Yes	49(48)	53(52)	
Side effects of vaccine are serious			
No	131(62.7)	78(37.3)	<0.003
Yes	105(51)	109(50.9)	
COVID-19 vaccine is safe			
No	4(5.3)	71(94.7)	<0.0001
Yes	232(66.7)	116(33.3)	
Perceived severity			
I am at risk of contracting COVID-19			
No	10(12.7)	69(87.3)	<0.0001
Yes	226(65.2)	118(34.3)	
Complications of COVID-19 are serious			
No	15(21.1)	56(78.9)	<0.0001
Yes	221(62.8)	131(37.2)	
Perceived benefits			
Receiving COVID-19 vaccine will protect me			
No	9(12)	66(88)	<0.0001
Yes	227(65.2)	126(35.8)	
COVID-19 vaccine is effective			
No	5(6.2)	76(93.8)	<0.0001
Yes	231(67.5)	111(32.5)	
Vaccination against COVID-19 will end the pandemic			
No	26(22.8)	88(77.2)	<0.0001
Yes	210(68)	99(32)	

Table 8 facilitators to COVID-19 Vaccine uptake

Multiple logistic regression model was done for factors significantly associated with COVID-19 vaccine uptake. On conducting binary logistic regression, it emerged that fear of getting COVID-19, OR 0.234(95% 0.056-0.974, p-value 0.046), trusting that COVID-19 vaccine is effective OR 0.131 (95%

0.031-0.553, p-value 0.006), being not afraid of side effects of the vaccine OR 6.872 (95% 3.651-12.938 p-value 0.000), and believing that the vaccine is safe OR 0.098 (95% 0.024-0.398, p-value 0.001) were the independent predictors of uptake (Table 9)

Predictor	Coeff	S.E.	p-value	OR	95% C.I.for OR	
					Lower	Upper
Concerns of contracting COVID-19	-1.451	.726	0.046	.234	.056	.972
Having a chronic illness	.905	.572	0.114	2.472	.805	7.589
Fear of spreading COVID-19	-1.100	.651	0.091	.333	.093	1.193
Risk of getting COVID-19	.555	.689	0.420	1.742	.452	6.722
Fear of complications	-.936	.640	0.144	.392	.112	1.375
Vaccine is protective	-.004	.682	0.995	.996	.261	3.794
Vaccine is effective	-2.031	.734	0.006	.131	.031	.553
Vaccine will end pandemic	-.246	.488	0.615	.782	.301	2.035
Fear of side effects	1.92	.32	0.000	6.8	3.65	12.9
COVID-19 vaccine is safe	-2.322	.715	0.001	.098	.024	.398
Minutes to vaccine station	-.001	.011	0.930	.999	.979	1.020
Access to vaccine station	.296	.173	0.088	1.344	.957	1.888

Table 9 predictors to COVID-19 Vaccine uptake

VIII. DISCUSSION

In this study we found 58.6% of participants were female, 41.1% were male and 0.2% represented other groups. This is nearly identical to the country's overall population distribution, which is comprised of 42.2% men and 55.8% women [8]. Relative to a survey conducted in Kericho County, where awareness was 81.5% [9], the level of knowledge of the COVID-19 vaccine was greater at 90%. The variation may be because of nationwide campaigns. The level of uptake of the COVID-19 vaccine in the present study was 55.8%, which fell short of the widely advised coverage of 70%, by mid-2022 [10]. This puts our elderly population at risk of severe COVID-19 and disease complications.

IX. BARRIERS TO COVID-19 VACCINE UPTAKE

The most common reason reported for non-vaccination was that vaccinated people were still getting infected. This suggests that vaccination uptake might be increased even further by disseminating more accurate information about it to all members of society. Fear of the side effects was a significant barrier to COVID-19 vaccine uptake. This was in tandem with another study conducted among the elderly in Poland, which was exploring potential predictors for COVID-19 vaccination [11]. This implies health officials should concentrate on educating the public about the potential side effects

and emphasize COVID-19 vaccine safety to increase vaccine rates significantly. The policymakers and health officials should also reassure the community there is an ongoing process of monitoring vaccine side effects after a new vaccine is introduced. In this study inability to walk or access public transport (p=0.044) was a barrier to the uptake of the COVID-19 vaccine. Having to walk a longer distance to the vaccination center was also a barrier 19 minutes vs 23 minutes, p=0.010. These results were similar and comparable to those found by Mazar et al. in a study whose objective was to check whether long distance to vaccine sites was the cause of under-vaccination, it found that distance was a significant obstacle to vaccine uptake. These findings were also in tandem with a previous study conducted in Kericho County, where distance from immunization sites was linked to a higher chance of vaccine delays [9]. This indicates that elderly individuals may benefit from outreach initiatives that bring vaccinations closer to their homes. This will result in a large decrease in the number of older individuals who have transportation issues needing to go further to receive vaccinations.

X. FACILITATORS OF COVID-19 VACCINE UPTAKE

Like a study conducted in Nigeria by Adedeji-Adenola et al [12], the current study found that the main source of the COVID-19 vaccine message was the media (94.6%) and most of the respondents were aware of the COVID-19 vaccine (90%). This shows that radio can be used as the primary channel of COVID-19 messaging. 64.8% of participants who received COVID-19 vaccine were influenced by healthcare workers. This finding aligns with an earlier Indonesian study that found that healthcare providers have a significant impact on COVID-19 vaccine uptake [13]. This emphasizes on critical role played by healthcare providers in vaccination.

Based on the results, the most common reason for taking up the vaccine was because it was free (84.3%). This result is consistent with research done on women in Ghana, where participants were inspired to participate in vaccination programs by the fact that vaccines were free [14]. Also, the findings showed that perceived susceptibility was positively associated with COVID-19 vaccine uptake. This is in line with a study conducted among the elderly in Indonesia, people who believed that COVID-19 is a serious illness, and are at risk of contracting it, and know that vaccination effectively lessens its severity got vaccinated against COVID-19 to avoid contracting it [13]. Similarly, a study conducted by Badr et al. in the United States found out that people with chronic conditions were likely to receive vaccine [15]. The present study mirrored findings in research conducted in Tanah Bumbu Regency among senior citizens, whereby perceived barriers, benefits, vulnerabilities, and severity influenced the acceptability of the COVID-19 vaccine [16].

CONCLUSION

In summary, the research revealed several barriers and facilitators to COVID-19 vaccine uptake among the elderly in Kiambu County. This study concluded that fear of the side effects, restricted access to immunization facilities and the fact that vaccinated people were still getting infected were the major barriers to COVID-19 vaccine uptake. As a result, health officials should concentrate on educating the public about the potential side effects and emphasize COVID-19 vaccine safety to increase vaccination rates significantly. The policymakers and health officials should also reassure the community there is an ongoing process of monitoring vaccine side effects after the new vaccine is introduced. To encourage older persons to receive vaccinations, outreach scheduling of vaccination appointments is essential. Also, to assist in facilitating the immunization of those who are housebound, policymakers should collaborate with primary healthcare practitioners. The study demonstrated that perceived severity, perceived susceptibility, and perceived benefits were promotors of COVID-19 vaccine uptake. This information is important to pertinent parties involved with COVID-19 immunization campaigns to maintain or enhance the facilitators to boost COVID-19 vaccine uptake.

There were limitations in this study, the sample size does not accurately represent the elderly population in Kiambu county. To more accurately represent the population, a bigger sample size should be used in future research. More variables can be included in future research, to explore factors influencing vaccine uptake.

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