

Knowledge and Covid 19 Vaccine Uptake among Elderly in Ogun State, Nigeria

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Abstract:- The elderly are at higher risk of COVID19-associated morbidity and mortality than other age groups and have been prioritized for COVID19 vaccination. Therefore this study assessed knowledge and COVID-19 vaccine uptake among elderly in Ogun State Nigeria.

This study employed cross-sectional design. One hundred and seventy-five participants were selected using a multistage sampling technique. A validated structured questionnaire was used in data collection. The data collected was analyzed using descriptive and inferential statistics; all statistical tests were performed at a level of significance $p \leq 0.05$.

The participants mean age was 67.4 ± 2.3 and less than half (40.6%) had no formal education. The participants mean knowledge score was 10.6 ± 5.8 , while 64.0% had poor knowledge of COVID-19 vaccine. Only 2.3% reported they had been vaccinated against COVID 19, while more than half (67.4%) were willing to receive the vaccine against COVID 19. There was a significant difference in the average knowledge score in the age group ($F = 7.6$; $p = 0.001$). Also, no significant relationship was found between participants knowledge and uptake of COVID-19 vaccine ($X^2 = 2.3$; $p = 0.3$).

In conclusion, participants had low knowledge about the COVID19 vaccine and poor uptake of the COVID 19 vaccine. Larger proportions of participants were willing to receive the COVID19 vaccine. It is recommended to implement an educational intervention to increase their knowledge and improve uptake of the COVID 19 vaccine.

Keywords: COVID 19 vaccine, Elderly, Knowledge, Uptake.

I. INTRODUCTION

Coronavirus disease (COVID19) is a deadly viral disease that affects several nations across the globe. The death rate of the COVID19 virus is higher than that of common contagious diseases. The symptoms of COVID19 include fever, fatigue, dry cough, shortness of breath, pneumonia, anosmia, and ageusia [1-3]. COVID 19 is transmitted by droplets, contact with infected patients, fomites, contact with surfaces, or contaminated objects. [4].

Though all age groups are at risk of COVID-19, the elderly people face considerable risks of having severe illness if they are diseased because of their physiological changes that develop with aging and the possible outcome of underlying health statuses [5]. COVID-19 has escalated the morbidities and mortalities in those with an underlying

chronic disease and those with a suppressed immunity despite their ages, and in the elderly people who were more susceptible to have these conditions. It is reported that the mortality rate for the elderly people in the age of 60 increases to 8.0% and 14.8% at the age of 70 and over 80 [6].

So far, non-pharmaceutical interventions have been able to slow the progress of the disease, but the most favorable approach to curtail the pandemic and reduce death and disease rates relies in medical technology, antiviral agents and vaccines. The most reliable and worthwhile public health intervention ever, which has saved millions of lives, is a vaccine [7-8]. Immunization fuels the immune system to produce antibodies to fight a specific infectious agent in the body. [9].

COVID19 vaccines have evolved rapidly, with some already approved and available for people over the age of 16 years. [10]. Success in ending the COVID19 pandemic depends in large part on the mass rollout of vaccines. Vaccination against COVID19 in Nigeria started on March 5, 2021. As of November 23, 2021, 6,021,560 people have received their first dose of the COVID19 vaccine and 3,369,628 people have received their second dose [11]. The first phase of the vaccination was for frontline health workers and persons aged 50 and above. People aged 18 to 49 with comorbidities were also vaccinated [12]. Achieving effective effects from a vaccine depends not only on accessibility but also on public acceptance and readiness to be vaccinated. [13]. Several studies have identified factors affecting the acceptability of COVID19 vaccines, such as: personal beliefs regarding vaccines and COVID19 [14-15], health literacy [16-17], knowledge [14, 18].

This implies that people who consider that the coronavirus is infectious and deadly, have good understanding and achieve high health literacy are more likely than others to accept COVID19 vaccines. Improving these factors through educational interventions can improve vaccine acceptance rates. Thus, elderly must improve their knowledge and health literacy which will increase the uptake of vaccines in the future. In order to facilitate the design of such educational intervention program, however, formative research aimed at generating baseline information related to the knowledge and acceptability of the COVID19 vaccine among the elderly is needed. This explained why this study assessed the knowledge and uptake of COVID- 19 vaccine among the elderly in Ogun State, Nigeria.

II. MATERIAL AND METHODS

A. Study Design and Sampling Technique

This is a descriptive, cross-sectional study conducted among elderly men and women aged 65 years and older in selected churches and mosques in four communities in Ogun State. The participants included elderly in Odeda Local Government, ImekoAfon Local Government, ObafemiOwode Local Government and Yewa North Local Government. A multi-staged sampling technique was employed to select the study participants as follows: The first stage was the random selection by ballot of two Senate areas from the three Senate areas in Ogun State, comprising 55% of the Local Government Areas in Ogun State. In the second stage Four LGA were selected by balloting out of the eleven (11) LGA in Ogun central and Ogun west senatorial districts. In the third phase, a proportional sampling technique was employed to select participants from places of worship (Churches and mosques). These places of worship were selected because most active elderly are usually found there. A total of one hundred and seventy-five participants were recruited for the study. The ethical issues discussed with the participants before they were included in the study was voluntary nature of participation in the study, freedom to withdrawal from the study anytime without any sanction and the inconvenience they might experience. Ethical approval was also obtained from the Babcock University Health Research and Ethics Committee (BUHREC).

B. Study instrument and Measure.

The instrument was a validated structured questionnaire that was self-administered. The questionnaire was developed after consulting previously published articles on the COVID-19 vaccine. The questionnaire included questions concerning socio-demographic information; knowledge relating to COVID -19 and COVID-19 Vaccine; and uptake of COVID 19 vaccine. The socio-demographic

characteristics assessed were age, sex ethnic group. Participants' level of knowledge was assessed using 33-point knowledge scale. The knowledge issues assessed included the following: causative agent of COVID-19, the mode of transmission, the prevention of COVID-19. Each correct response was allotted 1 mark while an incorrect answer was allotted "Don't know" was scored zero as well. Knowledge score were categorized into poor (0-11) fair (12-22) and good (23-33). A 2-point scale was used to assess the participants COVID-19 vaccine uptake. The question asked was if they have taking the COVID-19 vaccine and willing to take the COVID-19 vaccine. Each of the two items was scored as follows: Yes= 1, No = 0.

C. Data analysis.

The data obtained were selected and entered manually into the computer facilitated by a coding guide. The IBM Statistical Package for Service Solution Version 23 was used for data analysis to create descriptive statistics (frequency table, mean and standard deviation) and inference (correlation). All statistical tests were performed at a significance level of $P \leq 0.05$.

III. RESULTS

A. Participants Socio-demographic Characteristics

The socio-demographic characteristics of the participants were presented in Table 1. The participants were aged 65 to 77 years with a mean age and a standard deviation of 67.43 ± 2.30 years. Most 102 (58.3%) of the respondents were males. Less than half 71 (40.6%) of the respondents reported having no formal education. Half 88 (50.3%) of the respondents were Muslims. A little more than half 92 (52.6%) of the respondents were married. Most 113(64.6%) of the respondents reported being an artisan before they retired. A significant proportion 138(78.9%) of the respondents were from the Yoruba ethnic group.

| Socio demographic items | Frequency n= 175 | Percentage (%) |
|---|------------------|----------------|
| Age (in years) Mean age 67.43±2.30 years | | |
| 65-69 | 153 | 87.4 |
| 70-74 | 19 | 10.9 |
| 75-79 | 3 | 1.7 |
| Sex | | |
| Male | 102 | 58.3 |
| Female | 73 | 41.7 |
| Religion | | |
| Christian | 78 | 44.6 |
| Islam | 88 | 50.3 |
| Others | 9 | 5.2 |
| Level of Education | | |
| No formal | 71 | 40.6 |
| Primary | 53 | 30.3 |
| Secondary | 36 | 20.6 |
| Tertiary | 15 | 8.6 |
| Marital status | | |
| Married | 92 | 52.6 |
| Divorced | 52 | 29.7 |
| Widowed | 31 | 17.7 |
| Occupation before retirement | | |
| Civil servant | 24 | 13.7 |
| Traders | 38 | 21.7 |
| Artisans | 113 | 64.6 |
| Ethnicity | | |
| Yoruba | 138 | 78.9 |
| Igbo | 16 | 9.1 |
| Hausa | 21 | 12.0 |

Table 1: Socio-demographic Characteristics of the Participants in the study

B. Participant's Knowledge of COVID 19 Vaccine

Table 2 showed participants' knowledge of the COVID-19 vaccine. The knowledge items can be differentiated to the result of mode of transmission, symptoms of the COVID 19, types of COVID 19 vaccine and the dosage of the virus. Most (64.6%) of the participants' could not state correctly that COVID19 is a viral infection, moreover, the majority (65.7%) of the participants could not confirm that the pathogen that causes COVID19 could be transmitted from person to person. When enquiry was made concerning the spread of COVID-19, few (26.9%) of the participants correctly confirmed that COVID19 could be spread through direct contact with respiratory droplets from an infected person. Furthermore, a few 52 (29.7%) of the participants' correctly stated that touching the mouth/eyes after touching contaminated surfaces could result to the spread of COVID-19. As regards to the symptoms of COVID-19, the participant's correctly reported the following: fever (53.7%); throat (72.0%); dry cough (60.6%), difficulty breathing (33.7%); and loss of smell 68 (38.9%). Above a quarter (38.3%) of the participants' knew that there is a vaccine against COVID-19. Most (85.1%) of the participants correctly stated that the vaccination does not give a lifetime protection. As regards to the types of COVID-19 vaccine, the participants correctly stated the following; Moderna vaccine (18.3%), Johnson & Johnson vaccin (17.1%), Pfizer- Biontech (12.6%). A quarter (25.1%) of the participants' correctly knew that only two does of Pfizer-BioNTech vaccine is needed for complete immunity against the virus. Additionally, few (9.7%) of the

participants correctly knew that the second shot should be taken three weeks after the first shot, furthermore, only a small proportion (8.6%) knew that immunity against the virus is achieved after six weeks of complete vaccination. Above a quarter (26.3%) of the participants' correctly confirmed that the elderly and people with chronic illness such as diabetics (24.0%) are mostly susceptible to COVID-19. Less than half (28.0%) of the participants knew that avoiding crowded places could prevent someone from contracting COVID- 19 virus infection. Most (61.1%) of the participants knew that mask wearing prevents transmission of COVID-19 virus, in addition, more than half (53.7%) of the participants knew that social distancing could prevent transmission of the COVID19 virus. In contrast, only a few (20%) of the respondents knew that COVID-19 vaccine could prevent them from contracting COVID-19 virus. A small proportion (10.3%) of participants knew that COVID19 vaccines were made using inactivated coronavirus as an antigen Less than half (29.7%) of the participants knew that the COVID19 vaccine is given by injection.

The participants' mean knowledge score by socio-demographic characteristics are summarized in table 3. Participants who were aged 75-79 years had higher mean knowledge score 19.0 ± 5.56 compared to those ages 65-69 years (10.0 ± 5.6) and 70 -74 years (13.9 ± 5.2) with a significant difference. The mean knowledge score of the male and female participants were 9.5 ± 7.7 and 12.1 ± 5.5 respectively with a significant difference ($p < 0.05$). Also, participants who had tertiary education had higher mean

knowledge score 16.9 ± 7.0 compared to those with no formal education 8.7 ± 3.4 , primary education 10.4 ± 5.8 , and secondary education 12.1 ± 6.8 with a significant difference ($p < 0.05$). The mean knowledge score of the married, divorce and widowed participants were 11.7 ± 5.8 , 8.7 ± 5.4 , and 10.6 ± 5.7 respectively with a significant difference ($p < 0.05$).

Categorizations of the participants' level of knowledge are shown in figure 1. The mean \pm (SD) knowledge score was 10.6 ± 5.8 . Overall, few (3.4%) of the participants had high level of knowledge of COVID 19 virus and vaccine. The participants with moderate and poor level of knowledge were 32.6% and 64.0% respectively.

| Knowledge Items | Yes (%) | No (%) |
|---|------------------|------------|
| COVID-19 is a virus infection | 49 (28.0) | 126(72.0) |
| COVID-19 is transmitted from person to person | 51(29.1) | 124 (70.9) |
| How does COVID-19 spread? | | |
| COVID 19 is spread through direct contact with respiratory droplets of an infected person | 47(26.9) | 128 (73.1) |
| COVID 19 is spread by touching contaminated surfaces and touching the mouth/eyes/nose | 52(29.7) | 123(70.3) |
| Fever is a symptoms of COVID-19 | 94 (53.7) | 81(46.3) |
| Sore throat is a symptoms of COVID-19 | 126(72.0) | 49(28.0) |
| Dry cough is a symptoms of COVID-19 | 106 (60.6) | 69(39.4) |
| Difficulty breathing is a symptoms of COVID-19 | 59 (33.7) | 116(66.3) |
| Loss of smell is a symptoms of COVID-19 | 68(38.9) | 107(61.1) |
| Is there a vaccine against COVID-19 | 67(38.3) | 108(61.7) |
| COVID 19 vaccination give a lifetime protection | 26 (14.9) | 149(85.1) |
| Pfizer-BioNTech vaccine is a type of COVID 19 vaccine | 22 (12.6) | 153(87.4) |
| Moderna vaccine is a type of COVID 19 vaccine | 32 (18.3) | 143(81.7) |
| Johnson & Johnsons Jansen vaccine is a type of COVID 19 vaccine | 30 (17.1) | 145 (82.9) |
| Two doses of Pfizer-BioNTech vaccine is needed | 44 (25.1) | 131(74.9) |
| The second shot of vaccines should be taken 3 weeks after the first shot | 135 (77.7) | 40(22.3) |
| It takes the body 6 weeks to build immunity against COVID 19 virus after taking the vaccine | 15(8.6) | 160(91.4) |
| Elderly are most susceptible to COVID 19 | 46 (26.3) | 129(72.7) |
| People with chronic illness such as diabetes are most susceptible to COVID 19 | 42 (24.0) | 133 (76.0) |
| Avoiding crowded place prevent COVID-19 virus | 49 (28.0) | 126(72.0) |
| Use of face mask prevent transmission of COVID 19 virus | 107 (61.1) | 68(38.9) |
| Social distancing prevent transmission of COVID-19 virus | 94 (53.7) | 81(46.3) |
| COVID-19 vaccine prevent from getting COVID-19 infection | 35 (20.0) | 140(80.0) |
| COVID-19 vaccines was produced using in activated coronavirus as the antigen | 18 (10.3) | 157(89.7) |
| COVID-19 vaccine is given via injection | 52 (29.7) | 123(70.3) |
| Overall mean score | 10.6 ± 5.8 . | |

Table 2: Participants Knowledge of COVID-19

| Socio-demographic characteristics | Mean | SD | F-value | p-value |
|-----------------------------------|------|-----|---------|---------|
| Age (in years) | | | 7.6 | 0.001 |
| 65-69 | 10.0 | 5.6 | | |
| 70-74 | 13.9 | 5.3 | | |
| 75-79 | 19.0 | 5.6 | | |
| Gender | | | 8.7 | 0.004 |
| Male | 9.5 | 5.8 | | |
| Female | 12.1 | 5.5 | | |
| Level of Education | | | 10.9 | 0.001 |
| No formal education | 8.7 | 3.4 | | |
| Primary | 10.4 | 5.8 | | |
| Secondary | 12.1 | 6.8 | | |
| Tertiary | 16.9 | 7.0 | | |
| Marital Status | | | 4.6 | 0.01 |
| Married | 11.7 | 5.8 | | |
| Divorced | 8.7 | 5.4 | | |
| Widowed | 10.6 | 5.7 | | |

Table 3 Comparison of Participants Mean Knowledge Score of COVID 19 Vaccine by Socio-demographic Information

*Significant < 0.05

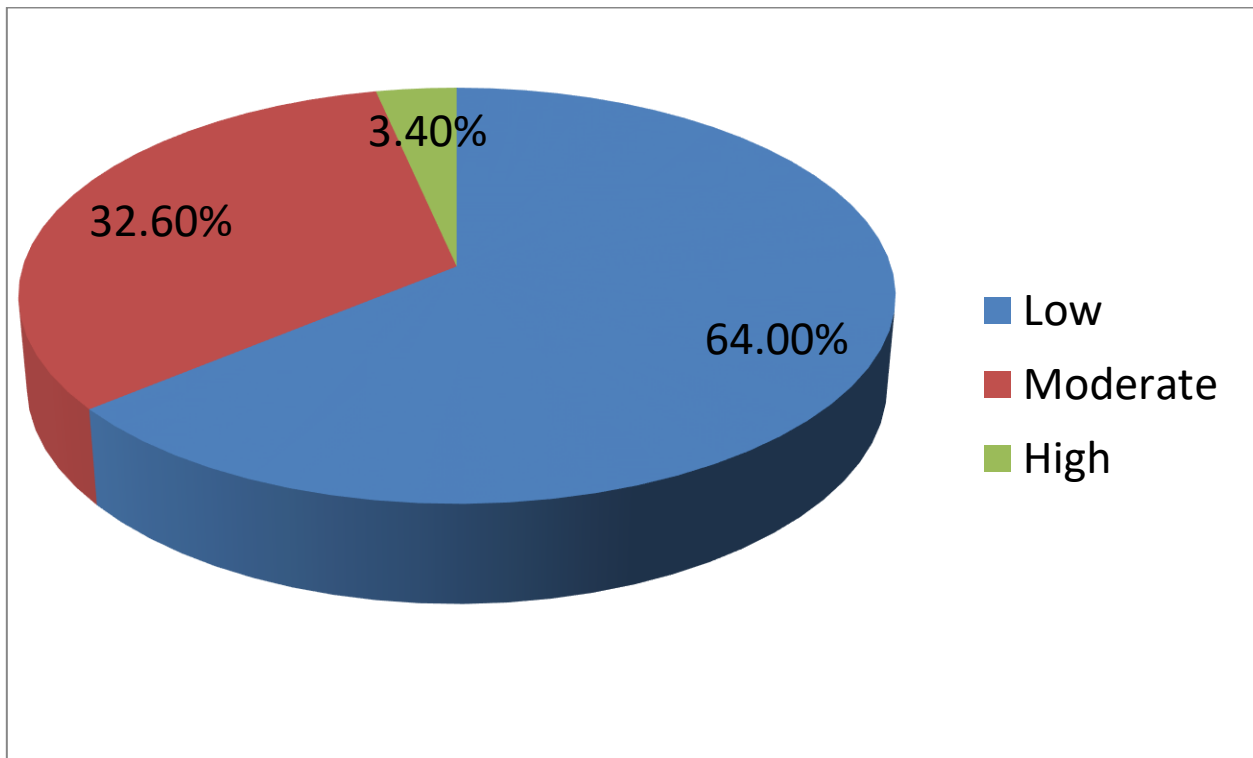


Fig. 1: Categorization of the Participants Level of Knowledge on COVID 19 Virus, and Vaccine

C. Participants COVID 19 vaccine Uptake

Only 4(2.3%) of the participants reported to had been vaccinated against COVID 19 virus and had completed their vaccination. More than half (67.4%) of the participants reported that they were willing to be vaccinated against COVID 19 virus (See, Table 4). There was no significant relationship between participants’ knowledge of COVID 19

vaccine and their uptake of COVID 19 vaccine ($\chi^2 = 2.3$; $p= 0.3$). There was no significant relationship between participants age and their uptake of COVID 19 vaccine ($\chi^2 = 0.9$; $p= 0.6$). Also, there was no significant relationship between participants level of education and COVID-19 vaccine uptake ($\chi^2 = 1.8$; $p= 0.6$) (See, Table 5).

| Items | Yes (%) | No (%) |
|---|-----------|-----------|
| Ever received COVID 19 vaccine | 4(2.3) | 171(97.7) |
| Dosage of COVID 19 vaccine received (n=4) | | |
| Two | 4(100) | |
| Willingness to received COVID 19 vaccine | 118(67.4) | 57(32.6) |

Table 4: Participants Uptake of COVID 19 Vaccines

| Variable | Ever Received COVID 19 Vaccine | | χ^2 -value | p-value |
|-----------------------------|--------------------------------|-----------|-----------------|---------|
| | Yes (%) | No (%) | | |
| Knowledge | | | 2.3 | 0.3 |
| Low | 4(3.6) | 108(96.4) | | |
| Moderate | 0(0.0) | 57(100) | | |
| High | 0(0.0) | 6(100) | | |
| Age group (in years) | | | 0.9 | 0.6 |
| 65-69 | 3(2.0) | 150(98.0) | | |
| 70-74 | 1(5.3) | 18(94.7) | | |
| 75-79 | 0(0.0) | 3(100) | | |
| Level of Education | | | 1.8 | 0.6 |
| No formal education | 2(2.8) | 69(97.2) | | |
| Primary | 2(3.80) | 51(96.2) | | |
| Secondary | 0(0.0) | 36(100) | | |
| Tertiary | 0(0.0) | 15(100) | | |

Table 5: Relationship between Participants’ Knowledge, Age, Level of Education and Uptake of COVID 19 vaccine

IV. DISCUSSION

This study was designed to evaluate the knowledge, and COVID-19 vaccine uptake among elderly in Ogun state, Nigeria. Generally, the participants had low knowledge of COVID 19 virus and vaccine. A similar findings was reported by Mohamed et al., in Malaysia and Enitan et al., in Nigeria, where they reported poor knowledge about COVID-19 vaccine [19-20] However, this finding is at variance with the reports of Khaja et al., in Saudi Arabia, and Huynh et al., in Vietnam, where they reported adequate knowledge of COVID-19 Virus and vaccine among their participants [21-22]. This difference in finding may be because of the difference in study location and study population.

This study revealed differences in the level of knowledge of the participants, as participants' who were within ages 74-79 years had high mean knowledge scores. This is not surprising as the risk of the infection increases with age, this may account for why the older participants were more knowledgeable. Similar finding was reported in Malaysia [19]. Also, the study revealed that the mean knowledge score of the female participants were higher than that of the male participants. This finding corroborates the result of Islam et al., in Bangladesh [23]. This may be because females tend to have better health seeking behaviour as compared to males. This study revealed that participants with tertiary education had higher mean knowledge score. This finding is in line with the finding reported in Bangladesh [23].

Majority of the participants in this study reported that they had never received COVID 19 vaccine. However, more than half of the participants reported they were willing to receive the vaccine. The willingness of the participants to receive COVID-19 vaccine may be because they are elderly and are at greater risk of developing COVID 19 Complications. Similar finding was reported in Malaysia, Saudi Arabia, and China [19, 24 &, to accept COVID-19 vaccine [20]. The differences in results may be because of the difference in the study population. This study revealed no significant relationship between participants' knowledge of COVID- 19 vaccine and their uptake. This implies 25]. This finding is in contrast to the finding of Enitan et al., in Nigeria, where they reported that most of their participants were unwilling that having knowledge alone is not sufficient for the uptake of the vaccine. Also, this study revealed no significant relationship between participants' level of education and uptake of COVID 19 Vaccine. This finding is in contrast to the finding of Spetz et al., in Sweden, where they reported significant relationship [26].

V. CONCLUSION

Participants had little knowledge about the COVID 19 virus and vaccine, poor uptake of the COVID19 vaccine, and were willing to receive the COVID19 vaccine. There were mean differences in participants' age, gender, and education level with respect to their knowledge of the COVID 19 virus and vaccine. Additionally, the knowledge, age, and education level of participants had no relationship to their uptake of the COVID19 vaccine. The results of this study constitute baseline information for the design of an evidence-based educational intervention to improve their knowledge about the COVID19 virus and vaccine, thereby facilitating the uptake of the COVID19 vaccine.

- **Conflict of interest** : We have no conflict of interest to declare.
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