Pneumococcal Vaccine Uptake among Adult Patients in a Tertiary Facility in Edo State, Nigeria

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ABSTRACT

Background: The vaccination rate among older adults varies in different country of the world. In Nigeria particularly, previous studies have recorded a very low pneumococcal vaccination rate in older adults. This study aim to assess the vaccination uptake among older adults in Irrua Specialist Teaching Hospital Irrua, Edo State, Nigeria.

Method: This was a cross-sectional study survey administered to 103 adults at the cardiology and general out-patient clinic of Irrua Specialist teaching Hospital Edo-State Nigeria between January 2025 and April 2025. Socio-demographic and clinical characteristics and Pneumococcal vaccination status were recorded.

Result: 103 respondents completed the questionnaire and the mean age of the older adults respondents was 56.5±17.7 years while the male to female ratio was 2:1.2. These are the percentage of the respondents: elderly adults 61(51.2%), between 50-64 years 36(35%) and less than 50 years are 6(5.8%).

Conclusion: pneumococcal vaccination rate among adults was noted to be poor and it has been found in this study that better patient education and prompt vaccine recommendation by the managing physician will improve vaccine uptake. A national guideline for adults' pneumococcal vaccine in Nigeria is needful.

Keywords: Vaccination rate, Vaccine preventable diseases, Congestive cardiac failure.

INTRODUCTION

Pneumococcal vaccines are vaccines against the bacterium Streptococcus pneumonia. Their use can prevent some cases of pneumonia, meningitis, and sepsis. There are two types of pneumococcal vaccines: conjugate vaccines and polysaccharide vaccines (1, 2). PCV13 has efficacy to prevent nonbacteremic pneumonia and invasive pneumococcal disease caused by vaccine serotypes in adults aged ≥65 years. For 65-year-olds and other at-risk individuals, the recommended schedule includes administration of a conjugated vaccine followed by a polysaccharide vaccine in this order. Despite evidence backing the need for pneumococcal vaccination campaigns, their effectiveness is impaired by limited knowledge about the right to free vaccination and other barriers in obtaining the vaccine, including willingness to get vaccinated. The current lack of publicly accessible official and disaggregated data are also crucial barriers in pneumococcal vaccine uptake in Nigeria.

Adults with chronic diseases or compromised immune status are at increased risk of respiratory infections, with pneumonia being the most common serious presentation and a significant cause of morbidity and mortality. Most European countries as well as North American Countries have well-established recommendations for adult pneumococcal vaccination for reducing the risk of pneumococcal infections in vulnerable individuals. However, there is no National guideline for adult pneumococcal vaccine recommendations in Nigeria. Currently, the recommendation is based on international guidelines and experts' opinions locally. There is also no existing policy mandating adult pneumococcal vaccine intake for the risk group. Childhood vaccination coverage in Nigeria has significantly improved in the past two decades averting millions of deaths per year. However, adult vaccination coverage remains poorly recorded and substandard.

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Many factors may affect adult vaccine coverage. A recent national survey conducted by the Government of Canada estimated that only 42.0% of eligible older adults have ever been vaccinated against pneumococcal disease. Consequently, as part of the Global Vaccine Action Plan, has aimed to reach an 80% vaccination coverage rate for adults 65 years or older by 2025 through both policy and community interventions. Similarly, an American study of Medicare claims from 2013 to 2015 identified that the majority of study patients did not receive a pneumococcal vaccine in the first year after turning 65.

A review of barriers to pneumococcal coverage in low and middle-income countries reported economic burden, poor health systems, and vaccine policies as major problems. Vaccine coverage may also be affected by the recommendations of the healthcare providers, even in patients with a negative attitude toward vaccination. There are gaps, inadequate recommendations and coverage of adult pneumococcal immunization in Nigeria. It has also be recorded that barriers to adult pneumococcal vaccination in Nigeria are multifactorial and professionals. These include access, availability, high cost, and lack of adequate recommendations by the health care professionals.

The Centers for Disease Control and Prevention (CDC) recommend pneumococcal vaccination schedules for children, adolescents, and adults. The recommendations are available to both healthcare professionals and the general public. Although the Nigerian childhood immunization program has been very successful, the same level of success has not been achieved in adults.

It has also be found that majority of physicians recommended the pneumococcal vaccine and most physicians recommended the vaccine for patients with chronic lung diseases. The common barriers in recommending vaccines reported were unavailability, poor reminder systems, high cost of vaccines, inadequate insurance coverage, vaccine shortage, and side effects.

Most of the physicians recommended the pneumococcal vaccine. The recommendation is more significant among physicians practicing in public and tertiary facilities. This is similar to the findings of a study in Turkey that reported physicians' recommendations of pneumococcal vaccinations is up to 83.4% of patients at risk seen. However, the lack of recommendations from physicians for half of the unvaccinated elderly patients was noted in another study in the US this implies that there commendations of vaccines by physicians are one of the key areas affecting adequate adult vaccine coverage. This is a potential target area to address to improve adult vaccine coverage. This can be addressed by ensuring the development of local guidelines for adult pneumococcal vaccination that will be made available to all physicians. There is also the need for a National Policy that will mandate adult pneumococcal vaccine coverage for the individuals at risk irrespective of the health care facility where a patient is being seen.. A National Survey in the US assessing that most physicians recommend pneumococcal vaccines for patients with chronic lung diseases, knowledge and practice of physician's on pneumococcal vaccination revealed that most Ojo OT. Babcock Univ. Med. J. 2022 5(1):37-44physicians recommend pneumococcal vaccines for their high-risk and elderly patients. The CDC recommended pneumococcal conjugate vaccination for adults, particularly those aged≥65 years and under 65 years with certain medical conditions such as asthma, heart disease, and diabetes (25, 26). CDC also recommends routine administration of pneumococcal polysaccharide vaccine (PPSV23) for all adults 65 years or older.

In line with the Global vaccine Action plan to reach 80% vaccination coverage rate for older adults at 65 years by 2025, it becomes expedite choosing Irrua specialist hospital been one of the federal tertiary hospitals attending to the vast majority of elderly patients in Edo state.

Therefore, this study is set to first of all, assess pneumococcal vaccine awareness and uptake rate among high-risk adult at the Irrua specialist Teaching hospital Irrua Edo state Nigeria. This will help to determine awareness and uptake level and further be used for policy making and guidelines in Nigeria.

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MATERIAL AND METHODS

Study Design

This was a descriptive cross-sectional study conducted at the general out-patient department and the cardiology clinic of Irrua specialist Teaching Hospital Irrua Edo state of Nigeria. Irrua Specialist Teaching hospital is located at Esan central local government in Edo State of Nigeria owned by the federal government of Nigeria.

This tertiary health institution is attending to vast population of all elderly adult out- patients both at the general clinic and the cardiology clinic of the hospital. All Elderly adults present at the out-patient clinic were eligible and a self-administered questionnaire approach was used.

Study Population

The study population includes adults that attended the general out patients and the cardiology clinic of Irrua Specialist Teaching Hospital with a total number of 103 adults at the cardiology and general out-patient clinic of Irrua Specialist teaching Hospital Edo-State Nigeria between January 2025 and April 2025.

Sample Size

The minimum sample size of 81.9 was used for this study, And was calculated using the formula for finite population size. The significant level was set to 0.05, and N is population of study. The targeted sample size was achieved using the formula given as:

$$n = \frac{N}{1+N(e^2)}$$

Where n= sample size

N= population of study

e =level of significance (taken at 5% or 0.05)

Data Collection and analysis

For the purpose of this research, data was obtained through self-administered primary source, the primary sources of data involved a questionnaire-based approach which entails administering questionnaire to outpatients, conducted at the general outpatient and cardiology out-patient clinic of Irrua specialist Teaching hospital Irrua Edo state of Nigeria.

Socio-demographic and clinical characteristics were recorded as well as Pneumococcal vaccination status, which includes the following reasons for non-vaccination. Worry about Pneumococcal pneumonia, Perception About vaccine Safety and Perceived ease of access to get vaccine respectively.

Data Analysis

Statistical analysis was done using the Statistical package for social-sciences (SPSS) version 21.0(Chicago IL. USA) Quantitative data were summarized. While qualitative data were summarized in frequencies and percentages. All results were presented in tables

TABLE 1 : SOCIO- DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Variable	Frequency (n=103)	Percentage
Age		
<50	6	5.8
50-64	36	35

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>64	61	51.2
Mean ± SD:	56.5±17.7	
Marital Status		
Male	64	62.18
Female	39	37.8
Level of Education		
Post-graduate	5	4.8
Tertiary	26	25.2
Secondary	21	20.3
Primary	51	49.5
Degree of urbanization		
City density populated area	5	4.8
Town	74	71.8
Rural area	24	23.2
Able to pay for Things Need in Life.		
with some difficulty	52	50.4
quite easy	33	31.9
Easy	18	17.5

RESULT

The socio-demographic characteristics of the participants are shown in Table 1. 103 respondents completed the questionnaire. The male to female ratio was 2:1.2, this is the percentage of the respondents: elderly adults 61(51.2%), between 50-64 years 36(35%) and less than 50 years are 6(5.8%). The mean age of the older adults respondents was 56.5±17.7 years.

Table 2 showed the Vaccination profile of the respondent. Only 3.88% of respondent were quite worried and 2.92% were little worried about pneumococcal pneumonia while 93.2% of respondent are not aware about the vaccine.

Table 2. Vaccination Profile of the Respondents

Variables	Category	Frequency (f)	Percentage (%)
Worry about Pneumococcal pneumonia	Quite worried	4	3.88
	Little worried	3	2.92
	Not aware about vaccine	96	93.20
Perception About Vaccine Safety	Not aware about vaccine	90	87.38
	Quite safe	10	9.71
	Very safe	3	2.91
Perceived Ease of Access to Vaccine	Quite easy	25	24.27
	Very easy	26	25.24
	Quite very difficult	52	50.49

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Can You Recommend Vaccine	Yes	22	21.36
	No	81	78.64
One View of Vaccination in General	No prior knowledge	90	87.38
	Favorable	1	0.97
	Quite safe	12	11.65
Barriers of Not Vaccinated	No awareness	59	57.28
	Vaccine not available	44	42.72

TABLE 3 : CLINICAL CHARACTERISTICS OF RESPONDENTS

Variable			**Frequency**		**Percentage**
Problem with Task due to physical or mental impairment					
Yes			24		23.3
No			79		94.1
Pneumopathy					
Yes			33		28.2
No			70		71.9
Cardiopathy					
Yes			48		46.6
No			55		53.4
Diabetes					
Yes			8		17.5
No			95		94.1
Worry about Pneumococcal pneumonia					
quite worried			3		2.88
Not aware about vaccine			97		94.1
Little worried			3		2.91

The clinical characteristics of the respondent shown above in Table 3 indicate the following: Yes, to Cardiopathy (48 ;46.6%), No to Cardiopathy (55, 53.4%). Yes, to Pneumopathy (33,28.2%) No to Pneumopathy (70,71.9%). Yes, to Diabetes (8,17.5%) No to Diabetes (95,94.1%)

DISCUSSION

T**h**is study set to assess the vaccination rate among the older adults at the general and the out patients department of Irrua specialist Teaching hospital Edo state, Nigeria. The means age of older Adults of the study population was 56.5±17.7 years.

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From the result and the analysis of the data, it has been proven empirically that pneumococcal vaccination rate and awareness among the study population was noted to be poor, this poor rate of awareness and vaccination could probably be related to the fact that there are presently no locally available guidelines for vaccination of adults in Nigeria.

However, this may not entirely be the sole reason, as poor vaccination rate has also been documented in developed countries with pneumococcal vaccination guidelines. The practice of adult's vaccination against preventable diseases (VPDs) in Nigeria has been very poor even though the knowledge and awareness of vaccine preventable diseases among adults' physicians has been found to be above average in many local studies. Adekunle et al, Akinbodewa et al and Ojo et al found different level of awareness among doctors about different VPDs, but this knowledge and awareness has not been shown to translate into practice.

In this study, there are other numerous reasons responsible for the poor vaccination rate recorded among the study population. Many of the unvaccinated patients had no prior information of pneumococcal vaccination and neither were they aware of the benefit of vaccination; this led to 93:2% of the respondents having not taken the vaccine. And over 69% of the respondents patients were not aware of the vaccine. Many factors have been shown in the data analysis which is associate factors to pneumococcal pneumonia among the study group, Yes to Cardiopathy (48 ;46.6%), No to Cardiopathy (55, 53.4%). Yes, to Pneumopathy (33,28.2%) NO to Pneumopathy (70,71.9%). Yes, to Diabetes (8,17.5%) No to Diabetes (95,94.1%)

Others factors that may be postulated to effect non- vaccination in this study population is the challenges of Nigeria healthcare which can possibly be seen as lack of adequate and functional health insurance that cater for the vast majority of the population group. Most of the older adult patients in this health facility have no health insurance and so therefore resort to out of -pocket payment.

Healthcare financing in Nigeria faces significant challenges, primarily due to low government investment, high out-of-pocket expenditures, and limited access to affordable health insurance. These challenges has lead to inadequate resource allocation, especially at the primary care level, and contribute to inequities in access to quality healthcare.

CONCLUSION

At the moment, this study represents one of the very few sources of information regarding pneumococcal vaccine uptake among adults in Nigeria. it has been found that uptake level appears inadequate poor, and the practice of pneumococcal vaccination among this specific study population group in Nigeria is largely not encouraging. Additionally, even though there are known locally guideline for pneumococcal practice in Nigeria, Physicians and healthcare providers should be kept abreast of the current international guidelines on pneumococcal vaccines and other vaccine preventable diseases (VPD) as the government make deliberate effort to ensure local guideline are been established.

Vaccination of high-risk adults should be incorporate into the national vaccination program currently being used in Nigeria. Meanwhile, various hospitals should develop standard protocols for pneumonia vaccination of the older patients pending the development of National guidelines so that high-risk older adults can have an overall and holistic care. Future research study should continue to target specific high- risk groups for under-vaccination, such as elderly adults with a smoking history and those with cardiovascular diseases. Future interventions may wish to focus on the individuals who are most vulnerable for invasive pneumococcal diseases and community acquired pneumococcal.

RECOMMENDATIONS

The following recommendations were made on the basis of the findings of this study:

Proper sensitization and awareness should be done for pneumococcal vaccination in Nigeria, most especially among this population study group. This study has recorded a very poor vaccination rate in Nigeria and one of the significant reasons was lack of proper sensitization and awareness.

1. Proper sensitization should include information campaigns, such as mass information campaigns (eg publications, television radio) dissemination of educational materials regarding vaccination, advantages of being vaccinated, indications protections dosing and logistics and training intervention for healthcare worker.
2. Prioritization of vaccination schemes, decision –making tools that support the priority vaccination of select groups based on the available evidence, and practical resources that enables this prioritization should be implemented at all level.
3. Primary healthcare interventions housed within primary care (eg generalist care family medicine) that take leverage of existing relationship and familiar infrastructure to promote vaccination should be encourage. In conclusion, Government should ensure that a local guideline for adult pneumococcal vaccination in Nigeria is established.

Ethical considerations

The study proposal was reviewed by the ethical board of Irrua specialist Teaching Hospital. All the recruited patients gave their consent to participate in the study and their confidentiality was maintained throughout.

Availability of data and materials

The data are available in the manuscript. The data sets used and analyzed during the current study are available from the corresponding author on a reasonable request.

Conflict of interests

There is no potential competing or conflicting interest. The author received no support or grant from any funding agency.

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