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THE INFLUENCE OF SOCIO-DEMOGRAPHIC CHARACTERISTICS ON UPTAKE OF GLAUCOMA SCREENING SERVICES AMONG ADULTS AGED 40 YEARS AND ABOVE IN IMO STATE.

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ABSTRACT

Glaucoma is a global public eye health concern, being the second leading cause of irreversible blindness worldwide after cataract. The aim of this study was to determine the influence of socio-demographic characteristics on uptake of glaucoma screening services among adults aged 40 years and above in Imo state. A descriptive cross-sectional study design was used for the study. The study setting cut across the three senatorial zones of Imo State, located in southern Nigeria. A total of four hundred and eighty-two (482) adults that participated in the study were recruited via a probability multi-staged sampling technique, and a structured questionnaire was used to obtain information relevant to the study. Statistical Package for Social Sciences (SPSS) version 23.0 was used for the analysis of the study, and the chi square test was used for testing the hypothesis ($p > 0.05$). Results from the study revealed that the most prevalent (37.6%) age group among the respondents was the age group between 60 and 69 years. The statistical relationship between the socio-demographic characteristics and the uptake of glaucoma screening services showed that the socio-demographic characteristics such as age (P=0.0027), level of education (P=0.0046), occupation (P=0.0332), and monthly income (P=0.0011) of the aged adults were all found to be significantly related to the uptake of glaucoma screening services. It was concluded that a number of factors influence the uptake of eye screening among older adults, including the individual's perceived need for screening, access to eye care services, affordability of eye care services, and the presence of a support network. Regular ophthalmic care can curb blindness due to glaucoma to a certain extent. Hence, adults are expected to avail themselves of eye care services such as screening for glaucoma that promote early detection of ophthalmic problem. It is also recommended that public awareness of the importance of glaucoma screening be increased, as well as the government's provision of facilities to improve access to glaucoma screening services in Imo State.

KEYWORDS: Glaucoma, Screening, Socio-demographic characteristics, Risk factors, Adults, Nigeria.

1. INTRODUCTION

Glaucoma is a global public eye health concern, being the second leading cause of irreversible blindness worldwide after cataract (Robertson, 2020). In Nigeria, glaucoma has been found to be responsible for sixteen percent (16%) of the blindness among the population aged 40 years and above (Kyari, 2015). Allison *et al.,* (2020) stated that about 80 million people have glaucoma worldwide in 2020, and this number is expected to increase to over 111 million by the year 2040.

One of the most prevalent forms of glaucoma is Primary Open Angle Glaucoma (POAG) accounting for up to seventy-four percent (74%) of all glaucomas (Kapetanakis et al., 2016). POAG has a serious impact on the quality of life of a large number of people around the world. POAG usually has an insidious onset, which may explain why most glaucoma patients present late. It has been estimated that more than half of glaucoma patients are already blind in at least one eye at presentation in Africa (Ogbonnaya, 2016).

Glaucoma is a disease characterized by atrophy of the optic nerve, elevated intraocular pressure associated with optic disc cupping and progressive loss of vision which is more prevalent among the population aged 40 years and above (Khurana, 2012, Robertson, 2020). Major risk

factors for glaucoma are intraocular pressure (IOP) and age (Hashemi *et al.,* 2018; Grzybowski *et al.,* 2020). Prevalence of glaucoma increases with age among the population older than fifty (50) years being particularly high in blacks. Other studied risk factors include race, gender and family history of the disease (Hashemi *et al.,* 2018).

Imo state is chosen for this study because of numerous eye clinics operating in the three geopolitical zones in the state (Owerri, Orlu and Okigwe), which offer glaucoma screening services. One cannot help but wonder why patients presented with glaucoma at its advanced stage as has been observed by the researcher on the field clinic in Imo state. This would not have been the case if these patients availed themselves of timely glaucoma screening services which of course would result to early detection of glaucoma, where present. It is based on this, that the researcher is motivated to conduct this research aimed at determining the factors that influence the uptake of glaucoma screening services among the more vulnerable population (adults aged forty years and above) in Imo state. The findings of this study will form useful input for policies, programmes and services that promote uptake of glaucoma screening in Imo state with the attendant benefits in eye health. The variables of interest include uptake of glaucoma screening services as the dependent variable and socio-demographic characteristics as the independent variable.

Several studies have examined the association of socio-demographic factors and the uptake of eye care services. A study by Olusanya (2016) on the reasons for non-utilization of eye care services among adults in a rural West African population revealed that the reasons given for non utilization include the perception that the eye problem was not important, financial constraints, ageism, fear and not knowing where to go for help. Barriers encountered were long distance, long waiting time, repeated appointments, strikes by hospital staff and poor service delivery´

Where there are accessible and affordable eye care services, there are several factors that may influence utilization. Some demographic factors that may influence the uptake of eye care services include the following.

a) Age

Older age is positively associated with utilization of eye care services (Morka *et al.,* 2020). In a study by Morka et al., (2020) on Eye care service utilization and associated factors among older adults in Hawassa city, South Ethiopia, it was found that older age was significantly associated with utilization of eye care services. Similarly, Olusanya et al (2016), in their study on the Determinants of Utilization of Eye Care Services in a Rural Adult Population of a Developing Country; age ≥70 years was one of the factors noted to be associated with increased likelihood of utilization of eye care services. Most of the major eye diseases/problem such as presbyopia, glaucoma, age- related cataract, diabetic retinopathy, age-related macular degeneration are age-related which progress with time (Nowak *et al.,* 2015). Therefore, eye diseases affect an individual more and more as age increase. This enforces the older age group to seek eye care more than the younger age group. Opththalmic and Optometric best practices recommend older adults to visit an eye care professional regularly to have a comprehensive eye examination (Morka *et al.,* 2020).

b) Gender

Population-based surveys in several countries have shown that 60 to 65 percent of those blind from cataract are female (Qunru et al., 2020). They also stated that the female gender has remained a significant barrier to access of cataract surgery in South Asia in the past two decades (Qunru et al., 2020). Health providers acknowledged that women's multiple roles and responsibilities acted as barriers to utilization of eye care services and that the interaction of gender-specific barriers had an important influence on their ability to seek eye health services, particularly elderly women (Neyhouser *et al.,* 2018).

d) Level of education

Chinawa and Chime (2017) in their study, reported that level of education had statistically significant effect on the utilization of eye care service. They further stated that though level of education is an important factor but not all have or would have the opportunity to attain higher education. Thus it becomes necessary to invest in informal education towards increasing awareness and knowledge of eye diseases first among hospital staff and our communities at large (Chinawa and Chime, 2017). A study carried out by Monsudi et al (2018) among health workers in a tertiary hospital in Birnin Kebbi, Nigeria indicate that the overall level of glaucoma awareness and knowledge were high among clinical health workers with a high level of education. Ntsoane and Oduntan (2010) reported that the likelihood of seeking eye care in Iran was associated with higher levels of education. This relationship was attributable to greater knowledge and therefore, more reasonable behaviour. It was also presumed to be due to the fact that educated people are members of the higher socioeconomic class, thus may have greater access to the eye care services and find them more affordable.

e) Socioeconomic status

Socio-economic status has been found to influence the use of eye care services (Morka *et al.,* 2020). They found that individuals with optional vision insurance and those with higher income levels were more likely to use eye care services. Morales et al. (2010) also reported that people with lower socioeconomic status are less likely to have eye examination. A study by Morka et al., (2020) on Eye care service utilization and associated factors among older adults in Hawassa city, South Ethiopia,

revealed that higher family income was significantly associated with utilization of eye care services.

2. MATERIALS AND METHODS

Study Design

A descriptive cross sectional study design was adopted for this study on the uptake of glaucoma screening services among adults aged 40 years and above in Imo State, Nigeria.

Area of study

The study area was the three senatorial zones of Imo State located in the South Eastern, Nigeria. Imo State is located in the South Eastern part of the Country with its Latitude and longitude coordinates as: 5.476310, 7.025853 with Owerri as its capital and the largest city in Imo state. Imo state has a population of 5,408,800 (National Population Commission 2022 projection) and the population density of 1,053 people per square kilometre. It was created in 1976 out of the old east central state by the then regime of General Murtala Mohammed. Imo state is divided into three (3) zones of Owerri, Okigwe and Orlu. The zones are further divided into twenty-seven (27) Local Government Areas (LGA), where Orlu has 12 LGAs Owerri, 9LGAs and Okigwe has 6 LGAs. Within the twenty-seven (27) LGAs are six hundred and fifty-five (655) Autonomous communities.

There are several universities and colleges in the state such as Imo State University, Federal University of Technology Owerri, Federal Polytechnic Nekede and Alvan Ikoku College of Education. There are also some general and teaching hospitals in Imo state which offer eye care services. There are also some private ophthalmic clinics in the state which provide general eye care services. There are about ten (10) public eye care centres and 53 registered private eye clinics in Imo state (Ministry of Health, 2019).

The local language is Igbo and Christianity is the predominant religion. Igbo people constitute a majority of the population. The study area was sampled from the twenty-seven (27) Local Government Areas in Imo state Nigeria. The predominant occupation of the people here are farming and Civil service.

Study Population

The population of study included all adults aged forty years and above not diagnosed of glaucoma and are permanent residents (lived at least six months) in the study area. The population of study also excluded adults with mental disorder and hearing impairment that were not able to provide information that supported the study as well as the feeble elderly patients.

Sample Size and Sampling methods

The sample size was calculated using the Taro Yamane formula for sample size calculation for a given population, formulated by the statistician Taro Yamane in 1967. The mathematical illustration of the Taro Yamene formula is as follows.

$n = N/1 + N(e)^2$

where

n is the sample size

N is the population under study

e is the marginal error

The population under study was calculated from the 2022 projected population according to National Population Commission (NPC). The population of adults aged 40 years and above as at 2022 has been obtained as 1,141,376 (NPC, 2022).

Therefore, to determine the sample size for the study, n using the formula

$n = N/1 + N(e)^2$ and substituting the figures appropriately,

$n = 1,141,376 \div (1+ 1,141,376\ (0.05)^2$

$n = 1,141,376 \div (1,141,377 \times 0.0025)$

$= 1,141,376 \div (2853.4)$

$= 400$

The population size was increased by 30% to compensate for non response.

30% of 400 = 120

Therefore 400 + 120 = 520

Sample size to be made use of will be 520

This sample size was shared proportionally among the three senatorial zones according to the percentage contribution of the population of adults aged 40 years and above of each senatorial zone in Imo state.

Sampling Techniques

A multistage sampling technique was adopted for this study on the uptake of glaucoma screening among adults aged 40 yrs and above in Imo state. A probability based stratified sampling method was used to select the three senatorial zones of Imo state based on population. This was done to ensure that every zone in Imo state was represented on the sampling frame. The second stage involved the selection of 30% of the Local Governments Areas (L.G.As) in each senatorial zone using simple random sampling technique (balloting). Thus, 4 LGAs (namely; Oru east, Oguta, Nwagele, Isu) out of the 12 LGAs in Orlu were selected. The 3 LGAs (namely; Ikeduru, Ahiazu Mbaise and Owerri West) out of the 9LGAs in Owerri were selected and 2 LGAs (namely; Obowo and Mbano) out of the 6 LGAs in Okigwe were selected.

The researcher enlisted all the Communities (while differentiating the rural from the urban) in the selected LGAs on different ballot papers and randomly selected two communities out of them precisely one from the urban and one from the rural areas. This was done to ensure that every community had an equal chance of being selected. Following the stratification of each of two selected communities into urban and rural areas, the villages in each community was listed and balloting was

done for a probability method of selection giving an equal chance of being selected from the selected villages. Five (5) villages were selected via simple random sampling in each of the selected community. This resulted to a total of 10 villages in each LGA.

A list of the streets and households at the villages was obtained by the researcher and systematic random sampling method was employed in selection of the streets and households where the study subjects were domiciled. This was done at an interval of two (2) for every household and street. This was done to ensure that every street and household had an equal chance of being selected. Following community entry and informed consent, purposive sampling was used to select the target population being adults aged 40 years and above who had resided in the study area for at least six months. Research Assistants were hired to get study population. Health Education as well as visual acuity screening test were used as incentives while complications were referred for treatment.

Instruments for Data Collection

(i) *A pretested structured questionnaire* divided into five sections, A, B, C, D and E. Section A elicited information on respondents' socio-economic characteristics and Section B comprised of questions on the level of knowledge about glaucoma, while section C comprised of questions on attitudes and practices with regard to glaucoma screening, section D comprised of questions on health service factors with respect to uptake of glaucoma screening services and Section E comprised of questions on eye screening behaviour.

(ii) *A visual Acuity Snellen Chart or illiterate E Chart* - Visual acuity of each respondent was also tested using a Snellen chart (for the literate subjects) or an Illiterate E chart, for the uneducated/illiterates (located 6m from the participant in a shaded open space in daylight; each eye was tested separately by asking the respondent to read the chart. The last line on the chart, which was read completely, was recorded as the respondent's visual acuity for the particular eye being tested. As a rule of thumb, eye care professionals always conduct what is called an "Entry Visual Acuity Assessment" on every patient before any other eye test procedure is carried out. This is to avoid cases of patients coming up with complaints of poorer vision after their visit to the eye doctor or better vision prior to their visit to the eye doctor. In such cases, the "Entry Visual Acuity Assessment" recorded by the doctor can exonerate him or her.

(iii) *A Pen torch*- The pen torch was used to assess pupillary response in both eyes. It was used to ascertain light perception to ensure the subject is not blind in any of the eyes. If a torch was shone on the respondent's eye, and the pupil failed to constrict, then the respondent is blind in that particular eye.

Data Collection

The questionnaires were administered to the respondents by the trained research assistants after an informed consent was obtained. The literate respondents were allowed to fill the questionnaire themselves with the guidance of the researcher and research assistants while the non-literate respondents, had the questionnaire translated into Igbo language, the questions were read out for them by the research assistants and their answers ticked appropriately by the research assistants.

Data Analysis

The SPSS program, version 23.0 was used for data entry and analysis. Descriptive statistics, including frequencies, percentages and means were generated. Bivariate and multivariate analyses were performed. The hypothesis was analysed using Chi square.

3. RESULTS

A total of five hundred and twenty (520) copies of the questionnaire were distributed for the study and four hundred and eighty-two (482) copies of the questionnaire were retrieved and they were properly filled and crosschecked for correctness and were used for the purpose of the analysis.

Socio-Demographic Characteristics

From table 1 below, 37.8% (182) of the respondents were aged between 60 and 69 years of age, 27.0% (130) were aged 70 years and above, 18.7% (90) were between 50 and 59 years of age, and 16.6% (80) were aged between 40 and 49 years. 59.8% of the respondents were male, and 40.2% were females. A majority were Christians (70.1%), while just 7.9% were muslims and only 2.9% were of the tradional religion and 19.1% were of other forms of religion. 208 (43.2%) of the respondents were married, 155(32.2%) co-habiting, 28(5.8%) divorced, only 6 (1.2%) were single while 85 (17.6%) belonged to other forms of marital status not listed. Slightly over half (50.8%) of the respondents had attained tertiary education as their highest educational level, 25.5% of the respondents had secondary education as their highest educational level, and 13.5% had primary education as their highest level of education, only 4% had no formal education and 6.2 % of them had other forms of education not listed. 31.3% (151) were into trading/business, 26.3%(127) public/civil servants, 7.9%(38) were farmers, 25.4%(123) were artisans and 8.9%(43) had other types of occupation not listed.. Only 18.9% of the respondents earned below N30,000. Majority (41.2%) of the respondents earned between N30,000 - N59,000 monthly, 16.2% earned between N60,000-N89,000, 12.1% earned between N90,000-N119,000 and 11.6% earned N120,000 and above.

Table 1: Socio-Demographic Characteristics.

Characteristics	Frequency (n=482)	Percentage (%)
Age		
40 - 49yrs	80	16.6
50 - 59yrs	90	18.7
60 – 69yrs	182	37.8
70yrs and Above	130	27.0
Total	**482**	**100**
Gender		
Male	288	59.8
Female	194	40.2
Total	**482**	**100**
Religion		
Christianity	338	70.1
Muslim	38	7.9
Traditional	14	2.9
Others	92	19.1
Total	**482**	**100**
Marital status		
Married	208	43.2
Single	6	1.2
Divorced	28	5.8
Co-habiting	155	32.2
Others	85	17.6
Total	**482**	**100**
Highest level of Education		
No formal education	19	4.0
Primary	65	13.5
Secondary	123	25.5
Tertiary	245	50.8
Others	30	6.2
Total	**482**	**100**
Occupation		
Farming	38	7.9
Trading/Business	151	31.3
Artisans	123	25.4
Public/Civil Servant	127	26.3
Others	43	8.9
Total	**482**	**100**
Monthly income		
Below N30,000	91	18.9
N30,000 - N59,000	199	41.2
N 60,000 - N 89,000	78	16.2
N 90,000 – N119,000	58	12.1
N120,000 and above	56	11.6
Total	**482**	**100**

Relationship between the socio-demographic characteristics of adults aged 40 years and above in Imo state and the uptake of glaucoma screening services

The Table below showed the results for the test of a statistically significant relationship between socio-demographic characteristics of aged adults in Imo state and the uptake of glaucoma screening services. The socio-economic characteristics of the aged adults was found to be significantly related to the uptake of glaucoma screening services among the respondents in Imo state (*P*= 0.00237). This is so because, P is less than 0.05 (P< 0.05), we reject the null hypothesis that there is no significant relationship between the socio-demographic characteristics of aged adults in Imo state and the uptake of glaucoma screening services.

Relationship between the socio-demographic characteristics of adults aged 40 years and above in Imo state and the uptake of glaucoma screening services.

Socio-demographic characteristics	Uptake of Glaucoma Screening Services		X^2	Pvalue	Decision
	Good(%)	Poor(%)			
Age	84.2%	15.8%	2.20	0.0027	**S**
Marital status	49.2%	50.8%	6.72	0.128	**NS**
Level of Education	77.2%	22.8%	1.20	0.0046	**S**
Occup ation	63.5%	36.5%	4.52	0.0332	**S**
Monthly income	69.1%	29.9%	7.11	0.0011	**S**

4. DISCUSSION

Influence of socio-demographic factors on the uptake of glaucoma screening services

Results from this study demonstrated a relationship between the socio-demographic characteristics of the aged adults (P= 0.00237) and the uptake of glaucoma screening services among the respondents in Imo state. Similarly, studies by Moore *et al.,* (2015) (P=0.023) and Yallapragada *et al.,* (2019) (P= 0.001) found socio-demographic factors, including age, gender, income level, and education to be associated with the uptake of eye screening.

Several studies have found that socio-economic factors such as higher income and education level are associated with greater knowledge of glaucoma, more positive attitudes towards glaucoma screening, and greater uptake of glaucoma screening services (Mariotti *et al.,* 2008; Frick *et al.,* 2009; Sarwar *et al.,* 2012). For example, a study in the United States (Frick *et al.,* 2009) found that higher levels of education and higher incomes were

associated with increased knowledge of glaucoma and greater willingness to undergo glaucoma screening. In addition, the study found that higher incomes and greater education levels were associated with greater uptake of glaucoma screening services.

5. CONCLUSION

In conclusion, glaucoma is a leading cause of blindness and is most common in individuals over the age of 40 in Imo State. It is associated with family genetics and can be asymptomatic in elderly patients. The awareness and level of knowledge of glaucoma influences the uptake of glaucoma screening services.

6. RECOMMENDATIONS

This study recommends the following.

1. Increase public awareness of the importance of glaucoma screening: Public health campaigns should be conducted to ensure that adults aged 40 and above in Imo State are aware of the importance of glaucoma screening services and their associated benefits.
2. Improve access to glaucoma screening services: The government should ensure that there are sufficient facilities providing glaucoma screening services in Imo State and that these services are easily accessible to the population.
3. Make glaucoma screening services affordable: The government should make glaucoma screening services affordable and within the reach of the population in Imo State.
4. Train more health workers in the management of glaucoma: The government should ensure that more health workers are trained in the management of glaucoma so as to improve the capacity of health institutions to provide glaucoma screening services.
5. Introduce incentives to encourage glaucoma screening: The government should introduce incentives such as tax rebates or discounts to encourage adults in Imo State to take up glaucoma screening services.
6. Utilize existing health infrastructure: The government should utilize existing health infrastructure such as primary health care centers to provide glaucoma screening services for aged adults.

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