(RESEARCH ARTICLE)

Factors influencing uptake of glaucoma screening services among adults aged forty years and above in Owerri Imo state

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Abstract

Glaucoma is the second leading cause of irreversible blindness worldwide after cataract. The aim of this study was to determine factors influencing uptake of glaucoma screening among adults aged 40 years and above in Owerri with emphasis on eye screening behaviour. A descriptive cross-sectional study design was used to recruit four hundred (400) adults via a probability multi-stage sampling technique. A structured questionnaire was used to obtain data which were analyzed using SPSS program. Results revealed, majority (85%) of the participants had heard of glaucoma. 256 (75.3%) respondents had gone for eye screening and out of this, 64.8% had gone for glaucoma screening. Those who never went for eye screening had reasons such as unaffordability of cost (25%), far distance of clinic (17.9%), no escort (19%). The most common eye problems revealed were presbyopia (17.3%), dry eye syndrome (15.8%). Results also showed that out of the 400 respondents, 183 (45.8%) showed at least one ocular sign of glaucoma while 159 (39.8%) showed more than one ocular sign of glaucoma. Statistical analysis showed that positive eye screening behaviour was significantly related to the uptake of glaucoma screening services. In conclusion, regular ophthalmic care can limit blindness due to glaucoma. Adults should assess eye care services such as glaucoma screening to help early detection of ophthalmic problems. Public awareness of the benefits of glaucoma screening as well as the government's provision of facilities to enhance access to glaucoma screening services in Owerri, Imo State were recommended.

Keywords: Glaucoma; Screening; Blindness; Risk factors; Adults; Owerri

1. Introduction

Glaucoma, the second leading cause of irreversible blindness globally after cataract, is a significant public health concern (Robertson, 2020). In Nigeria, glaucoma has been identified as the primary cause of blindness in 16% of individuals aged 40 years and above (Kyari et al., 2015). In 2013, the number of people (aged 40-80 years) with glaucoma worldwide was estimated to be 64.3 million, increasing to 76.0 million in 2020 (Tham et al., 2014). Similarly, Allison et al. (2020) have reported that there were approximately 80 million individuals with glaucoma worldwide in 2020, and this figure is projected to surpass 111 million by 2040.

The commonest type of glaucoma is primary open angle type which is a silent blinding disease (Ogunmola et al., 2024) because the loss of vision usually occurs slowly over a long period of time and patients are usually diagnosed late in the disease because they do not have symptoms in the early stage. 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). Factors related to eye care

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service delivery may significantly influence individuals' willingness to utilize glaucoma screening services. 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; Ogunmola et al.,2024).

1.1. Problem Statement

Regular ophthalmic care can curb blindness due to glaucoma to a certain extent (Smith et al., 2018), hence adults are expected to avail themselves of eye care services that promote early detection of ophthalmic problems such as screening for glaucoma. However, this is not the situation in Owerri, Imo state. The researcher has observed with considerable concern while operating in a public eye care center in Owerri, Imo state that the majority of instances of glaucoma are identified when glaucoma has reached an advanced stage, or when vision has been entirely lost in one eye. Additionally, it has been documented that the prevalence of visual impairment and blindness in Imo state is significant where glaucoma is the second most prevalent cause of visual impairment and blindness in Imo state (Achigbu and Ezeanosike, 2017). The occurrence of blindness resulting from glaucoma can be prevented through early detection and swift treatment. Consequently, the purpose of this investigation is to ascertain the factors that influence the uptake of glaucoma screening services among individuals aged forty years and above in Owerri, Imo state as well as identify individuals already presenting with the ocular risk factors of glaucoma.

1.2. Objectives of the Study

The main Objective of the Study was to determine factors influencing the uptake of glaucoma screening services in Owerri, Imo state. Other objectives include;

- To ascertain the impact of eye screening behaviour on the uptake of glaucoma screening services among people aged 40 and above in Owerri, Imo state.
- To determine the ocular problems prevalent among adults aged 40 years and above in Owerri, Imo state.
- To identify respondents already presenting with the ocular risk factors of glaucoma among adults aged 40 years above in Owerri, Imo state.
- To identify the barriers to the uptake of glaucoma screening services among adults aged 40 years and above in Owerri

1.3. Factors Influencing Utilization of Eye Care Service

Eye care service utilization is the use of eye care service by persons for the purpose of preventing and curing eye problems, promoting maintenance of eye health or obtaining information about one's eye health and prognosis (Morka et al., 2020). There are three primary factors namely, availability, affordability and accessibility of eye care services which could influence the prevention of visual impairment worldwide (Ntsoane and Oduntan, 2010)..

1.4. Availability of Eye Care Services

Ntsoane and Oduntan (2010) in their study noted that Ophthalmological services are not readily accessible in various parts of Africa, including the rural areas of developing countries. Sub-Saharan Africa, specifically, possesses a mere 2.5 Ophthalmologists per one million individuals (International Agency for the Prevention of Blindness, 2014). Nigeria, for instance, has 3.3 Ophthalmologists per one million population, which exceeds the sub-Saharan regional average of 2.5. However, this figure falls short of the recommended four Ophthalmologists per one million population. The unequal distribution of Optometry and Ophthalmological services between rural and urban areas in many developing nations may contribute to a higher prevalence of visual impairment in rural regions. Consequently, unknown cases of blinding diseases such as cataract, glaucoma, and diabetic retinopathy, may experience delays in receiving appropriate management, potentially resulting in low vision or even blindness. Impoverished individuals often rely on government hospitals for their eye care needs, including refractive corrections. A study conducted by Olusanya et al. in 2018 explored the reasons behind the non-utilization of eye care services among adults in a rural West African population. The study revealed that individuals cited various reasons for not seeking eye care, including the perception that their eye problem was not of significant importance, financial constraints, aging, fear, and a lack of awareness regarding where to seek help. Additionally, individuals encountered numerous barriers, such as long distances, extended waiting times, repeated appointments, strikes by hospital staff, and poor service delivery.

1.5. Accessibility to Eye Care Services

The examination of the distance traveled or time taken to reach healthcare providers has the potential to yield valuable insights into the primary obstacles hindering individuals' access to adequate healthcare in specific geographical areas (Solomon et al., 2022). The assessment of access to ophthalmic care has been conducted through the analysis of visit rates to eye care providers. Qualitative investigations have revealed that the perceived barrier to seeking eye care among older individuals is the distance to the healthcare practitioner (Wright et al., 2019). In a study conducted by Okoye et al. (2018) on the impediments to accessing quality eye care services in Nigeria, it was found that poverty and the inability to afford eye care services were the most prominent obstacles encountered by the population. Additional barriers include the distance between eye care service centers and rural communities, concerns about potential high cost of eye care by service providers, apprehension regarding treatment outcomes, and the availability of less expensive treatment alternatives. In a particular region of western Nigeria, the majority of eye care services were concentrated in urban areas, making them inaccessible to rural residents and resulting in a lack of adequate care for individuals with preventable and treatable eye conditions. Consequently, rural communities often turn to alternative sources of care, such as traditional healers and patent medicine sellers, who serve as frontline healthcare workers.

A study conducted by Merepa et al. (2017) revealed that the distance to eye care facilities and transportation were identified as significant barriers to the utilization of eye care services in Ghana. According to Ibeneche et al. (2018), respondents in the federal capital territory of Abuja, Nigeria reported several barriers impacting their access to eye care services, including a lack of perceived need (accounting for 61.7% of responses), high costs of services, financial constraints, limited availability of eye care services, long waiting times, and reluctance to seek eye care services.

1.6. Affordability of Eye Care Services

The provision of eye care services is also impacted by financial considerations. Kumari et al. (2020) have identified several financial challenges that affect eye services in both developed and developing countries. Particularly in rural areas, poverty becomes a significant concern as individuals are unable to afford the expenses associated with eye care services. Consequently, issues that should have been addressed at an early stage are often overlooked, resulting in the prevalence of low vision and blindness (Kumari et al., 2020). In Nigeria, poverty, high costs, and the inability to pay for treatment have been recognized as barriers to accessing quality eye care services (Okoye et al., 2018). Furthermore, Vemulapalli et al. (2020) found that cataracts are responsible for 42.9% of cases of blindness in Nigeria, yet a significant number of individuals affected by cataract-related blindness have not undergone surgery due to the prohibitive costs associated with the procedure (Vemulapalli et al., 2019). Hence, affordability emerges as one of the primary barriers to the utilization of eye care services.

1.7. Screening for glaucoma

Glaucoma screening is frequently conducted using examinations that observe alterations in the optic nerve, modifications in the intraocular pressure, and adjustments in visual fields. The objective of screening is to detect early-stage glaucoma that does not impair an individual's visual acuity but may indicate an increased likelihood of vision loss in the future. This facilitates the identification of individuals who could potentially benefit from therapeutic interventions. It is crucial to undergo regular ocular evaluations that encompass the assessment of intraocular pressure.

1.8. Diagnosis of glaucoma

Regular and comprehensive eye examinations are crucial for the early detection of glaucoma and the protection of one's vision from potential damage. These examinations encompass various assessments such as vision tests, ophthalmoscopy to evaluate the optic nerve, tonometry to measure eye pressure, gonioscopy to examine the eye's drainage angle, and perimetry to assess the visual field of each eye. By comparing the information gathered from these examinations at regular intervals, it is possible to determine if there has been any progression in glaucoma damage over time.

2. Materials and methods

2.1. Study Design

A descriptive cross-sectional study design was adopted for this study.

2.2. Area of study

The study area under consideration was Owerri, the capital of Imo state, situated in the south eastern zone of Nigeria. Owerri, is the largest urban centre in the state. The current metro area population of Owerri in 2026 is 1,105,000, a 3.85% increase from 2025 (Macrotrends, 2026) with a land area of about 551km². Owerri is made up of three (3) local government areas (LGAs) namely Owerri Municipal, Owerri West and Owerri North. There are about forty-four (44) eye care centres in Owerri as of October 15th, 2025 (Rentech Dgital, 2025). The core language spoken in Owerri is Igbo, while Christianity is the dominant religion and the occupation of its people is centred around trading, agriculture and services. Owerri serves as a major trade and administrative centre for Imo state.

2.3. Study Population

The estimated population of adults aged 40 and above as of 2026 in the Owerri urban area is approximately 240 000 (City Population, n.d). The study population included all adults aged forty years and above in Owerri and are permanent residents (lived at least six months) in the study area. The study population excluded adults with mental disorder and hearing impairment that were not able to provide information relevant to the study.

2.4. Sample Size and Sampling methods

2.4.1. Sample Size Selection

A sample size of 400 was made use of. 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 and

e is the marginal error

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

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

$n = 240\ 000 \div (1 + 240\ 000\ (0.05)^2$

$n = 240\ 000 \div (240\ 001 \times 0.0025)$

$= 240,000 \div (600)$

$= 400$

This sample size was shared proportionally among the three Local government areas in Owerri. According to City Population (n.d), the 40+ population estimates for 2026 are; Owerri Municipal approximately 24,300, Owerri North approximately 39,600, Owerri west approximately 24,100. The sample size of 400 was divided among the three local government areas using the following percentages 27.6%, 45% and 27.4% respectively.

Solving this mathematically,

27.6% of 400 = 110

45% of 400 = 180

27.4% of 400 = 110

This resulted to 110 + 180 + 110 = 400

2.5. Sampling Techniques

The three local government areas in Owerri formed the clusters.

2.5.1. Stage One: Selection of Communities

The first stage involved the selection of 30% of the autonomous communities in each L.G.A in Owerri using simple random sampling technique (balloting). This is because Hamed (2017) in his article on determining sample size has considered 30% of a target population adequate for a study so as to avoid sampling errors or biases. This resulted to the selection of six (6) communities in Owerri North, five (5) communities in Owerri west and two (2) communities in Owerri municipal. This resulted to a total of thirteen (13) communities.

2.5.2. Stage Two: Selection of Villages

In the third stage, the villages in each of the selected   communities were listed (with the help of the community heads) and balloting was used to select 30 % of these villages from each of the selected communities. This resulted to a total of seven (7) villages sampled in Owerri Municipal, thirteen (13) villages sampled in Owerri North and eight (8) villages sampled in Owerri west LGA.

2.5.3. Stage Three: Selection of Households

To determine the number of households sampled in each of the selected villages, the sample size of 400 was divided among the three LGAs in Owerri using the percentages 27.6%, 45% and 27.4% for Owerri Municipal, Owerri North and Owerri West respectively as obtained earlier.

This resulted to 110 + 180 + 110 = 400

i.e 110 respondents from Owerri municipal, 180 respondents from Owerri north and 110 respondents from Owerri west.

Therefore 110 was shared among the 7 villages sampled in Owerri municipal which resulted to 16 respondents from each village. 180 was also shared among the 13 villages sampled in Owerri north which resulted to 14 respondents from each village and 110 was shared among the 8 villages sampled in Owerri west which resulted to 14 respondents from each village. To determine the sampling interval, the World Health Organisation (WHO) formular was adopted which states that any community having more than 20 households, an interval of two can be used. The above formular was adopted to determine the sampling interval due to the fact that the researcher had difficulty determining the exact number of households in each of the villages sampled as well as their population sizes. A coin was tossed prior to the selection of households, and the researcher started from the direction where it faced. A random start of one (1) was selected and the researcher started with the first house in that direction. The subsequent houses to be sampled were selected using consistently a sampling interval of two (and maintaining the right side) after the initial visit to a house hold. This process was repeated until a total of 400 respondents were sampled.

2.5.4. Stage Four: Selection of respondents

The household that met the criteria was identified and visited in every chosen house. In a house with multiple eligible households, one household was chosen for the study through a random selection process. Similarly, where there were multiple eligible individuals in a selected household, only one person was chosen randomly and interviewed. This continued until the required sample size was obtained.

 Instruments for Data Collection

- A pretested structured questionnaire
- An illuminated visual Acuity Snellen Chart and an illiterate E chart
- An Ophthalmoscope
- A Non-contact Tonometer

3. Method of Data Collection

The questionnaires were administered to the respondents by the researchers and 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 were collected through face-to-face interviews with the respondents. The visual acuity of every participant was assessed by employing a Snellen chart (for those who could read) or an Illiterate E chart, for those who had no formal education. Vision tests were also carried out on respondents who were assessed for ocular signs of glaucoma including intraocular pressure and disc-cup ratio using a Non-contact Tonometer and an Ophthalmoscope respectively. Their visual fields were also assessed using a simple confrontation test.

3.1. Method of Data Analysis

The data entry and analysis were conducted using the SPSS program, specifically version 23.0. To describe the demographic characteristics, descriptive statistics such as frequencies, percentages, and mean values were utilized. Associations between eye screening behaviour, and uptake of glaucoma screening services were analyzed using Chi-square test and Regression. P values <0.05 were considered statistically significant.

3.2. Ethical Considerations and Informed Consent

A letter was acquired from the Ethical Clearance Committee of the Department of Dispensing Opticiary, School of Health Technology, Federal Polytechnic Nekede, Owerri in order to introduce the research and obtain ethical clearance. Prior to filling out the questionnaire, the respondents were given an informed written consent form and were made aware of the "no-risk" nature of their voluntary participation as well as the assurance of anonymity. The information provided by the respondents was also kept confidential.

4. Results

A total of four hundred (400) questionnaires were distributed and all were duly completed and retrieved.

4.1. Demographic Characteristics

Table 1 presents the data on demographic characteristics of respondents. The highest number of respondents (163; 40.8%) were found among those aged 60 and 69 years. while the least number (57; 14.3%) of respondents was recorded among those aged 70 years and above. 246 (61.5%) of the respondents were males and 154 (38.5%) females. A good number (88%) of the respondents had formal education while only 12% of them had no formal education.

Table 1 Demographic characteristics of Respondents

Characteristics	Frequency (n=400)	Percentage (%)
Age		
40 - 49yrs	106	26.5
50 - 59yrs	74	18.5
60 – 69yrs	163	40.8
70yrs and Above	57	14.3
Total	400	100
Gender		
Male	246	61.5
Female	154	38.5
Total	400	100
Highest level of Education		

No formal education	48	12
Formal education	352	88
Total	400	100

4.2. Awareness level of Glaucoma

Revealed in Table 2 below are the results of glaucoma awareness among the respondents. 85% (340) have heard of glaucoma while 15% of them have not.

Table 2 Glaucoma awareness

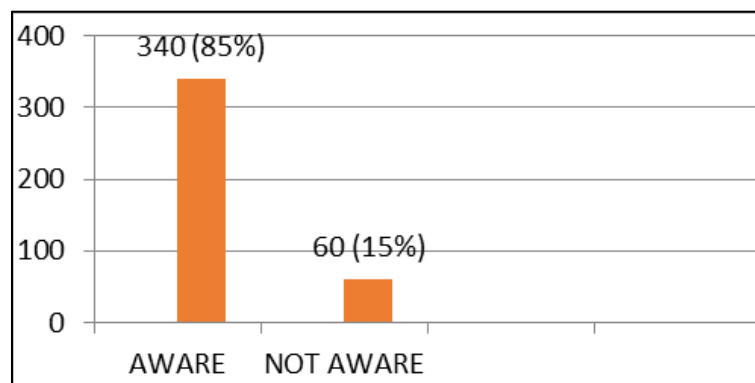| Have you heard of glaucoma?	Frequency (n=400)	Percentage (%)
YES	340	85%
NO	60	15%
TOTAL	400	100

Figure 1 The level of Glaucoma Awareness among Adults aged 40 years and above in Owerri, Imo state

5. Eye Screening Behaviour

Table 3 demonstrated the eye screening behaviour of adults aged 40 and above in Owerri. It could be seen in Table 3 that majority (75.3%) of the respondents had undergone eye examination prior to this study. Looking at the various eye problems which prompted those who had gone for eye examination to do so, it showed that presbyopia (17.3%) , dry eye syndrome (15.8%) and blurry vision (14.4%) were the most common eye problems, followed by eye trauma/injury/pain (13.7%), eye discharge/infection (12.2%), refractive error (9.4%), eye swelling (8.6%), and others (strabismus/eye deviations) (3.6%). Respondents who had not gone for any eye examinations reported reasons such as 'cost' (25%), no one to take them to the clinic (19%), health facility being far from where they live (17.9%), no eye problem (13.1%) and 'others' who said their belief does not permit it (25%). From the results in Table 3, it can be seen that 36 (14.0%) respondents went for routine eye check-up always (i.e four times a year in the last two years). 105 (41%) of them went for routine eye check-up sometimes (i.e two times a year in the last two years) and 115 (45%) of them never went for routine eye check up(i.e none in the last two years).

Those who took the decision by themselves were 26.2% of the respondents and some (10.5%) said their husbands took the decision, 11.3% said their wives while 12.9% of them said the decision was taken by another family member.

5.1. History of Eye Screening Behaviour

Table 3 Eye Screening Behaviour of Respondents

Variable	Frequency (n=340)	Percentage (%)
Ever gone for any eye examination		
Yes	256	75.3
No	84	32.8
Total	340	100
The eye problem/complaint that made you go for eye examination		
Refractive error (e.g. long sightedness/hyperopia, shortsightedness/myopia)	13	9.4
Presbyopia (not able to read tiny prints at normal range)	24	17.3
Dry eye syndrome (when the tears are not enough and the eyes feel dry)	22	15.8
Chalazion/stye (eye swelling)	12	8.6
Eye trauma/injury/pain	19	13.7
Conjunctivitis (eye redness)	7	5.0
Blurry vision (not seeing clearly)	20	14.4
Eye discharge/infection	17	12.2
Others (strabismus/eye deviation)	5	3.6
Total	139	100
Reasons for not ever going for eye examination. Multiple responses allowed if applicable.		
Cannot afford the cost	21	25.0
No one to take me to the Clinic	16	19.0
The health facility is far from where I live	15	17.9
No need for eye examination/No eye problem	11	13.1
Others (my belief does not permit it)	21	25.0
Total	84	100

5.2. Routine Eye check up

Table 4 Uptake of Routine eye check-ups among Respondents

Routine eye check-up	Frequency	Percentage (%)
Always (four times a year, in the last two years)	36	14.0
Sometimes (two times a year in the last two years)	105	41.0
Never (none in the last two years)	115	45.0
Total	256	100
Decision to go for eye check-up is primarily that of		
My-self	67	26.2

My husband	27	10.5
My wife	29	11.3
Joint (husband and wife)	96	37.5
Another family member	33	12.9
Others (friends, colleagues)	4	1.6
Total	256	100

5.3. Glaucoma Screening

Table 5 Uptake of Glaucoma screening among respondents

Ever gone for glaucoma screening		
Yes	166	64.8
No	31	12.2
Not sure	59	23.0
Total	256	100
Having any health insurance coverage (e.g NHIS) that helps offset eye care cost		
Yes	100	39.1
No	156	60.9
Total	256	100
Having health insurance coverage encourages me to go for eye screening		
Yes	79	79.0
No	2	2.0
Not sure	19	19.0
Total	100	100

Relationship between eye screening behaviour and the uptake of glaucoma screening services among adults aged 40 years and above in Imo state

Table 6 below showed a statistically significant relationship between eye screening behaviour and the uptake of glaucoma screening services among adults aged 40 years and above in Imo state (P= 0.007).

Table 6 Relationship between eye screening behaviour and the uptake of glaucoma screening services among adults aged 40 years and above in Owerri, Imo state

Uptake of glaucoma screening services	Eye screening behaviour		Total	χ^2	P-value	Decision
	Good (n%)	Poor (n%)				
YES	130 (78.3%)	36 (21.7%)	166	12.90	0.007	Significant
NO	11 (12.2%)	79 (87.8%)	90			
TOTAL	141	115	256			

5.4. Respondents showing Ocular signs of glaucoma

Table 7 below shows that out of the 400 respondents, 183 (45.8%) respondents were already showing at least one ocular sign of glaucoma while respondents who showed more than one ocular sign of glaucoma were 159 (39.8%) out of the 400 respondents sampled.

Table 7 Respondents showing Ocular signs of glaucoma

Ocular signs of glaucoma	Frequency (n =183)	Percentage (%)
Cup-disc ratio ≥ 0.5	82	44.8
Intraocular pressure ≥ 22mmHg	68	37.2
Abnormal visual field	33	18.0
TOTAL	183	100

6. Discussion

6.1. Influence of eye screening behaviour on the uptake of glaucoma screening services

Findings concerning the eye screening behavior of adults aged 40 years and above in Owerri showed that the majority (71.4%) of the respondents had undergone eye examinations. It was observed in this study that 85% of the respondents were aware of glaucoma while 64.8% of them had some time in their life undergone glaucoma screening. This is quite opposed to a study by Ogbonnaya et al (2016) among adults in a rural community (Nchokko village) in Ebonyi state where only 21.1% of the respondents were aware of Glaucoma and just 5% of the them had ever undergone glaucoma screening. In their study, it was noted that 82.8% of the respondents had secondary education or less. This could possibly be the reason for the poor glaucoma awareness and little percentage of respondents having ever undergone glaucoma screening.

Several studies have found that eye screening behavior is associated with uptake of glaucoma screening services among aged adults (Mariotti *et al.,* 2008; Frick *et al.,* 2009; Sarwar *et al.,* 2012). Studies (Frick et al., (2009); Sarwar et al., 2012) found that respondents who had previously undergone eye screening were more likely to undergo glaucoma screening than those who had not had a previous eye screening.

Previous research has revealed that the uptake of eye screening among older adults is low which goes against the findings of this study. Evidence from a study conducted by Smith *et al.* (2018) showed that among over 2,000 people aged 45 and older only 33% had undergone comprehensive eye screening in the previous two years. Other research by Moore et al. (2015) revealed similar results, with only 38% of individuals aged 55 who had undergone an eye screening in the past 6 months. These findings suggest that the level of uptake of eye screening among aged adults was generally low but impressive in Owerri. The primary factor distinguishing the low level of uptake of eye screening services recorded in these studies (Smith et al.*,* 2018; Moore et al.*,* 2015) and the high level of uptake of eye screening services recorded in this study may be increased level of awareness resulting from advocacies and health education on the media and other social informative/educative platforms as the years go by.

As stated by Moore et al. (2015) and Yallapragada et al.(2019), many adults in their study, were not aware of the need for regular eye examinations, or the symptoms of glaucoma which resulted to the low level of uptake of eye screening services recorded in their study. Another reason was cost, Smith et al.(2018), in their study, many (76%) adults were not able to afford the cost of eye exams and also did not have access to health insurance (62%). This is concurrent with the findings of this study which showed that 60.8% of the respondents did not have any health insurance coverage that helps them offset costs but only 25% agreed to "cost" being their reason for not assessing eye care services. The affordability of eye care services has been identified as an important barrier to access, especially among low-income and minority populations (Alhassan et al., 2020). Studies have found that adults who have a family member or friend encouraging them to get an eye examination are more likely to get screened than those who do not have such a support system (Hanson et al., 2019; Moore et al., 2015; Alhassan et al., 2020). This may not be a very relevant factor in Owerri as this study recorded only 19% of individuals who reported "no escort/no one to take them to the clinic" as their reason for not taking up glaucoma screening services. This may be because Owerri has both public and private healthcare facilities at different locations which could easily be assessed by these individuals. It was shown in this study that (45.8%) respondents were already showing at least one ocular sign of glaucoma while respondents who showed

more than one ocular sign of glaucoma were 159 (39.8%) out of the 400 respondents sampled. This slightly differs from the findings of the study by Mbadugha and Onakoya (2014) conducted in Lagos, Nigeria where 20% of the participants presented with ocular signs of glaucoma on examination. The difference could be as a result of different geographical locations. In addition, being a study conducted in 2014, this further indicates that glaucoma incidence might be on the increase. This is also in line with the studies by Tham et al. (2013) where they asserted that, in 2013, the number of people (aged 40-80 years) with glaucoma worldwide was estimated to be 64.3 million, increasing to 76.0 million in 2020. Similarly, Allison et al. (2020) have reported that there were approximately 80 million individuals with glaucoma worldwide in 2020, and this figure is projected to surpass 111 million by 2040.

This is a call to action for both the people and government of Owerri, Imo state and Nigeria at large to consider the uptake of glaucoma screening services as compulsory, especially for older adults. The government should also put in more effort in promoting eye health education and access to eye care services including glaucoma screening.

7. Conclusion

In conclusion, a number of factors influence the uptake of eye screening among aged 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. Eye screening behavior has been found to be associated with uptake of glaucoma screening services among aged adults. Those with positive eye screening behaviour were more likely to assess glaucoma screening services. This study recorded 39.8% possible glaucoma suspects (those who presented with at least two ocular signs of glaucoma). Though the glaucoma screening behaviour of the respondents was somewhat good (64.8%), there is an urgent need to develop continuous eye health education programmes to   improve the uptake of glaucoma screening among adults as glaucoma can be asymptomatic in older patients.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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