Towards Improving Community Eye Care: Beneficiary Perspectives around an Inner-City Community in Lagos Metropolis

Comment [P1]: Knowledge, Attitude, Practice should be included in the title

Abstract

BACKGROUND

The 2019 WHO World Report on Vision states that a quarter (2.2 billion people) of the world's population have a form of visual impairment or the other, with half of them being preventable. A higher burden of preventable visual impairment has been reported in regions with poor knowledge of eye care, non-availability of or poor uptake of available screening services. This study assessed the knowledge, attitude, and practices as well as factors associated with eyecare among the residents of an inner-city community in Lagos, Nigeria.

METHODS

This was a cross-sectional study using simple random sampling technique to select 254 consenting participants from a community eye care program in a community on Lagos Island. Data was collected electronically using Microsoft office forms and analyzed with SPSS version 23. Frequencies, proportions and tables were used for descriptive analysis. Chi-square test and multivariate logistic regression analysis were done to identify predictors of the outcome variables. The level of statistical significance for predictors was set at 5%.

Comment [P2]: Why?

RESULT

More of the respondents (52.4% and 61.4%) were middle-aged and female respectively with a mean age of 49.7±16.6 years. About 61.0% of them reported the use of prescription eyeglasses, 69.3% had a good knowledge of the importance of routine eye checks. Good attitude and practice of eye care were reported among 78.7% and 68.5% of the respondents respectively. Respondents with a tertiary level of education were more likely to have a good attitude towards eye care (OR=2.8; 95% CI=1.115-7.120) and good practice of eye care OR=2.7; 95% CI=1.207-5.869) versus lower educational levels.

CONCLUSION

This study highlights the importance of improving access to eye care services and enhancing knowledge among underserved populations; A need to target those with low educational levels with eye care interventions to reduce the burden of preventable eye diseases.

Efforts to increase access to education, particularly in low-income areas, can contribute to improved attitudes and practices related to eye health care. Addressing gaps in knowledge and promoting regular eye check-ups were seen to be essential steps toward achieving better eye health outcomes in Nigeria and similar settings.

Keywords; Eye Health, community eye care, inner city community, preventable visual impairments

Introduction :

The eye is a very important sense organ of the body that contributes significantly to overall health and wellness. Evidence from scientific work estimates that about 80% to 85% of what human beings perceive, is delivered through the sense of sight (1,2). As important as sight is, the World Health Organization World Report on Vision 2019 highlighted that a quarter (2.2 billion people) of the world's population have a form of visual impairment and 50% of them are due to preventable causes (3). As common as eye diseases are, individuals, can have a visual impairment and not notice deterioration in their sight for years (4), hence a significant number of eye problems could be detected late, especially in settings where eye examination services are not readily available, accessible or routinely conducted. The burden of visual impairment is disproportionately higher among the vulnerable population as nine out of every ten people with visual impairment are residents in the Low and Middle-Income Countries (LMICs) (5). About 23.6% of patients accessing eye care at a tertiary hospital in the Niger-Delta region of Nigeria had refractive errorswhile 37.3% of primary and secondary school students surveyed in southwestern Nigeria were found with refractive errors, making it one of the commonest eye diseases in Nigeria (6,7). The Shell Nigeria Exploration and Production Company (SNEPCo) is an organization that is committed to improving the overall health of the residents of its operation areas. The organization provides various critical health

intervention services as part of its corporate social responsibilities and the provision of preventive and curative eye care services for the vulnerable population is one of such. Towards achieving a reduction in the burden of visual impairment in Nigeria, the organization planned and implemented a community outreach that was focused on the provision of eye care services in one of its' host communities. Provision of spectacle for correction of various forms of refractive errors and cataract surgeries are some of the documented cost-effective interventions that could contribute to the reduction in the burden of visual impairment (5). Shell Nigeria Exploration and Production Company over the years has therefore focused on the provision of evidence-based eye care interventions to various population groups across the Niger-Delta region.

While evidence-based preventive and curative services to reduce the burden of visual impairment exist, the lack of access to such services in most LMICs, including Nigeria would be one of the many factors contributing significantly to the high burden of visual impairment in the country. As part of a global effort to increase access to eye health care for all people, irrespective of where they live, the global vision agenda was recently shifted to integrating eye health care into universal health coverage (UHC) so that people can access eye health care without experiencing financial hardship (8). One of the components of theagenda's framework is the Integrated People-centered Eye Care (IPEC). One of the strategies of IPEC is laying emphasis on the provision of preventive and curative eye health services and having them integrated into the existing health system (8). While the provision of these services is the responsibility of higher-level stakeholders, there is the need to engage and empower communities to access and utilize the provided services (8). The utilization of eye health services is however not automatic, but a function of what an individual knows, and the value placed on the eye/ sight. It has been documented that the knowledge and the practice of regular routine eye check is poor in High Income Countries (HICs) (9) and this is reportedly

expected to be worse in LIMCs (10). This study was therefore conducted to assess the knowledge, attitude, and practices of the residents of Lagos Island East towards ensuring that subsequent eye care interventions will be meeting identified needs of the people and would also be implemented using a people-centered approach. The findings of this study would also help to guide the provision of such interventions in other regions of the country for maximal impact.

Methods

Study Site

This survey was conducted in an urban slum community in Lagos Island, Lagos State, Nigeria. Lagos is a coastal, metropolitan city and projecting from the 2006 census, the State currently has an estimated population of 14,920,049 (11). For administrative purposes, Lagos State has 20 Local Government Areas (LGAs) and 56 Local Council Development Areas (LCDAs). It is a fast growing, densely populated city (2500/ km2) and as typical of every fast-growing city, it has multiple urban slums with high population of vulnerable people who are often marginalized from various social services such as education and health.

Comment [P3]: Not Needed

Study design and data collection

This survey utilized a cross-sectional study design and a quantitative data collection method to obtain information from 254 participants of a community eye care-focused outreach in an anurban slum on Lagos Island. The sample size for estimation of single proportion among infinite population was used to estimate the minimum sample size for this survey (12). The prevalence of 18% (people with good knowledge of cataract) from a previous study in southeast Nigeria (13), normal standard deviate of 1.96, a precision of 5% and non-response rate of 10% were used, and the minimum sample size was 252 people. Lagos Island East

LCDA was purposively selected based on the rationale of the outreach which was for the organization to give back to host community and since studies have shown a disparity in the health of slum dwellers compared to city dwellers (14), decision was made to conduct the survey in a slum settlement towards achieving the global agenda of equity and to ensure that with respect to achieving health for all, no one is left behind (REF). The list of marginalized/ slum settlements was obtained from the LCDA and simple random sampling technique by balloting was used to select one settlement (Adeniji-Adele) out of the 27 settlements in the LCDA. Participants who consented to the survey were recruited and data were collected using an interviewer-administered semi-structured questionnaire developed from the review of the literature. Information obtained fromrespondents included their sociodemographic characteristics, theirknowledge about eye care (importance of eye checkups, frequency of routine eye checkup and time of a child's first eye check), their attitude to eye care and their practice of eye checkup. Data were collected by trained personnel with a minimum qualification of a university degree. The purpose of the survey was explained to participants and no incentive was attached to their willingness to participate in the survey. Data was collected using a Computer-Assisted Personal Interview (CAPI) method

Data Analysis

Data was downloaded as a csv file and exported to Statistical Package for Social Sciences (SPSS) version 23. Data collected was thereafter cleaned and analyzed using SPSS version 23. Frequency, proportion, mean, standard deviation, and frequency tables were used for descriptive analysis. Chi-square for trends was used to assess for associations between ordinal categorical independent variables (age group and educational status) and the outcome variable while Pearson chi square was used to assess for associations between nominal categorical variables and the outcome variable. Multivariate logistic regression analysis was

done to identify predictors of the outcome variables and factors that were significant up to 10% were all loaded into the regression model. Level of statistical significance for all test was however set at 5%.

Description of variables

Age: < 20 years = adolescents, 20-44years young adults, 45-64 years middle aged, ≥ 65 years elderly

Educational status: This was assessed using the self-reported highest level of education attained by the respondents and was presented as those with "less than secondary level of education", "secondary level of education" and "tertiary level of education". Those that had no formal education and those with primary level of education were merged and categorized as "less than secondary education" while all other levels of education were presented as reported

Marital status was assessed and dichotomized as "currently married" and "not currently married". Respondents that reported that they were either single, separated or divorced were all categorized as "not currently married"

Job description: This variable was used to give a broad classification of the type of job the respondents are involved in based on their self-reported occupation. All respondents that reported that they were artisans, caterer, driver or cleaner were categorized as "service provision". Those that reported to be trader, small scale trader or large-scale trader were all categorized as "sales", civil servants and those that reported to be involved in office work in private sector were both categorized as "office work". The single respondent that reported to be unemployed was merged and reported with the retiree. The students and farmers were presented as reported by the respondents.

Comment [P4]: Does not make sense

Comment [P5]: The level of awareness will vary hugely

Knowledge of previous eye health was assessed using two questions: “Do you currently use recommended glasses?” and “Have you been previously diagnosed with visual impairment?”. Those that reported current use of recommended glasses but said they had never been diagnosed with visual impairment were categorized as having “Poor knowledge”. Those that reported they were currently not using glasses and that they had never been diagnosed with visual impairment were categorized as “Good knowledge”. Also, those that reported that they were currently using recommended glasses, but they had been previously diagnosed with visual impairment were also categorized as “Good knowledge”

Knowledge of regularity of eye check: This was assessed using the question “how many times should an individual have routine eye check done?” Those that responded “once in two years” were categorized as having “Good knowledge” while all other responses were categorized as “Poor knowledge”

Knowledge of importance of eye check to disease detection: This was assessed with the question “do you know that eye examination can help detect other medical condition?” Responses “Yes” were categorized as “Good knowledge” while “No” was categorized as “Poor knowledge”

Knowledge of importance of eye check to academic performance: This was assessed with the question “do you know that eye examination can help a child’s academic performances?” Responses “Yes” were categorized as “Good knowledge” while “No” and “Don’t know” were categorized as “Poor knowledge”

Overall knowledge of importance of eye check: This was dichotomized into two, respondents who had good knowledge of both the importance of eye check to disease detection and good knowledge of importance of eye check to academic performance were categorized as “Good knowledge”. Those with poor knowledge to either of the two or both were categorized as “Poor knowledge”

Knowledge of child's first eye examination: This was assessed using the question "at what stage should a child have the first eye examination done?" Responses within the first year of life was categorized as "Good knowledge" (15) while all other responses were categorized as "Poor knowledge"

Overall knowledge of eye care was assessed using three variables: "overall knowledge of importance of eye check", "knowledge of child's first eye examination" and "knowledge of eye check regularity". Respondents were awarded a score of "0" for poor knowledge and a score of "1" for good knowledge, hence the maximum obtainable score was 3 and the minimum obtainable score was 0. Scores of ≥ 2 and above were categorized as "Good knowledge" while all other scores were categorized as "Poor knowledge".

Attitude to eye care was assessed using respondents' response to the question "Do you think routine eye check is necessary?". Those that responded "Yes" were categorized as "Good attitude", while those that responded "No" and "Maybe" were categorized as "Poor attitude"

Practice of eye care was assessed using response to the question "how many times have you had eye check done in the last 2 years?". Those that reported to have had test done at least once were categorized as "Good practice" and those had none done were categorized as "Poor practice".

Results

Table 1: Socio-demographic characteristics of respondents

Comment [P6]: No reference of Table No 1 in the text

Variable	Frequency (N=254)	Proportion (%)
Age		
Adolescent	21	8.3
Young adult	50	19.8
Middle aged	132	52.4
Elderly	49	19.4
Mean (SD)	49.7 (16.6) years	
Sex		
Male	98	38.6
Female	156	61.4
Highest level of education		
No formal education	5	2.0
Primary level	32	12.6
Secondary level	123	48.4
Tertiary level	94	37.0
Marital Status		
Divorced	4	1.6
Separated	6	2.4
Single	35	13.8
Married	209	82.2
Religion		
Traditional	2	0.8
Christianity	109	42.9
Islam	143	56.3
Job description		
Service provision	13	5.1
Farmer	13	5.1
Retiree	18	7.1
Student	33	13.0
Office work	79	31.1
Sales	98	38.6

Sociodemographic Characteristics of Respondents

The mean age of the respondents was 49.7 years (SD= 16.6 years) with a majority (52.4%) of them being in the middle age group (45 -65 years) while the adolescents (< 20 years) were the least (8.3%). A higher proportion (61.4%) were females and those with secondary and tertiary level of education were in the majority (48.4% and 37.0% respectively). Respondents

who were married constituted a majority (82.3%) and a little above half (56.3%) were Muslims. A higher proportion of them, 38.6% were involved in sales related job while service providers and farmers were the least (5.1% each).

Table 2: Respondent's self-reported eye health history

Variable	Frequency (N=254)	Proportion (%)
Current use of recommended spectacle		
Yes	155	61.0
No	99	39.0
Previously diagnosed visual impairment**		
Cataract	49	19.3
Eye infection	30	11.8
Refractive error	27	10.6
Glaucoma	12	4.7
Hypertensive retinopathy	17	6.7
Diabetic retinopathy	10	3.9
None	142	55.9
Number of eye diagnosis (n=114)		
Multiple	5	4.4
Single	135	95.6
Self-rated importance of sight		
Important	252	99.2
Not important	2	0.8

** Multiple Responses

Respondent's self-reported eye health history

About a third (61.0%) of the respondents reported to be using recommended spectacles at the time of the survey. About half of the respondents (55.9%) however reported not to have been previously diagnosed with any visual impairment. Of those that reported visual impairment, cataract was the most reported visual impairment (19.3%) while diabetic retinopathy was the least reported (3.9%). Almost all the respondents (99.2%) rated sight as their most important sense organ.

Comment [P7]: No reference of Table No 2 in the text

Table 3: Respondent's knowledge, attitude and practice about eye health

Comment [P8]: No reference of Table No 3 in the text

Variable	Frequency (N=254)	Proportion (%)
Knowledge of previous eye health		
Poor	44	17.3
Good	210	82.7
Knowledge of eye check regularity		
Poor	230	90.6
Good	24	9.4
Knowledge of importance in other disease detection		
Poor	55	21.7
Good	199	78.3
Knowledge of importance in academic performance		
Poor	37	14.6
Good	217	85.4
Overall knowledge of importance of eye check		
Poor	78	30.7
Good	176	69.3
Time for a child's first eye examination		
Within first year of life	36	14.2
Before nursery school	40	15.8
Before primary school	45	17.6
Before secondary school	93	36.6
I don't know	40	15.8
Knowledge of child's first eye examination		
Poor	218	85.8
Good	36	14.2
Overall knowledge of eye care		
Poor	45	17.7
Good	209	82.3
Attitude to eye care		
Poor	54	21.3
Good	200	78.7
Practice of eye care		
Poor	80	31.5
Good	174	68.5
Reason for poor practice		
Poor knowledge #	48	60.0
Cost implication	18	22.5
No time	6	7.5
Fear/ anxiety	4	5.0
Bad previous experience	4	5.0

** Multiple responses # Don't know how often eye check should be done/ I do not have any complaint

A majority (82.7%) of the respondents were knowledgeable about their eye health based on previous diagnosis and the use of recommended glasses. The good knowledge of child's first eye examination and the regularity of eye check was low as 14.2% and 9.4% respectively

demonstrated good knowledge. About two third (69.3%) of the respondents had good knowledge of the importance of eye check.

A higher proportion (78.7% and 68.5%) of the respondents had good attitude to eye care and good practice of eye care respectively. Poor knowledge of eye screening was the main reason identified among those with poor practice as 60% of them reported either not knowing how often eye check should be done or considering eye check not needed since they didn't have any eye related complaint.

Table 4: Factors associated with respondents' overall knowledge, attitude and practice of eye care

Variable	Overall knowledge of eye care		Attitude to eye care					Practice of eye care				
	Chi Square test		Chi Square test		Multivariate Analysis			Chi Square test		Multivariate Analysis		
	Good n (%)	P-value	Good n (%)	P-value	AOR	Lower	Upper	Good n (%)	P-value	AOR	Lower	Upper
Age												
Adolescents	4 (19.0)		18 (85.7)					17 (81.0)				
Young adult	8 (16.0)	0.74	40 (80.0)	0.35				30 (60.0)	0.55			
Middle aged	23 (17.4)		104 (78.8)					89 (67.4)				
Elderly	10 (20.4)		37 (75.5)					38 (77.6)				
Sex												
Male	14 (14.3)	0.26	78 (79.6)	0.79				65 (66.3)	0.55			
Female	31 (19.9)		122 (78.2)					109 (69.9)				
Highest level of education												
< secondary	4 (10.8)		26 (70.3)		Ref			18 (48.6)		Ref		
Secondary	23 (18.7)	0.35	93 (75.6)	0.02*	1.4	0.595	3.105	89 (72.4)	0.04*	2.8	1.281	5.883
Tertiary	18 (19.1)		81 (86.2)		2.8	1.115	7.120	67 (71.3)		2.7	1.207	5.869
Marital Status												
Currently married	10 (22.2)	0.38	38 (84.4)	0.30				36 (80.0)	0.07	0.5	0.219	1.074
Not currently married	35 (16.7)		162 (77.5)					138 (66.0)		Ref		
Knowledge of previous eye health												
Poor	13 (29.5)	0.02*	39 (88.6)	0.08	Ref			32 (72.7)	0.51			
Good	32 (15.2)		161 (76.7)		3.9	0.145	1.057	142 (67.6)				

* Statistically Significant AOR Adjusted Odds Ratio

Table 4 shows that with increasing level of education, the proportion of respondents with good overall knowledge of eye care was also increasing, however this was not statistically significant. On the contrary, a higher proportion (29.5%) of respondents with poor knowledge of previous eye had good overall knowledge of eye care compared to 15.2% of those with good knowledge, this was a statistically significant association (p value=0.02).

A decrease in the proportion of respondents with good attitude to eye care was observed with increasing age but this was not statistically significant (p value=0.35). There was a statistically significant association between level of education and attitude to eye care as the proportion of respondents with good attitude was observed to increase with their level of education (p value=0.02). Respondents with tertiary level of education are about three times more likely to have a good attitude to eye care compared to those with less than secondary level of education (OR=2.8; 95% CI=1.115-7.120).

A higher proportion (80.0%) of respondents who were married had a good practice with respect to eye care compared to 66.0% of those not married but this was not statistically significant (P=0.07). Respondents level of education was identified as a predictor of good eye care practice as prevalence of good practice was observed to increase with level of education. The odds of good practice of eye care were higher among those with secondary (OR=2.8; 95% CI=1.281-5.883) and tertiary level of education (OR=2.7; 95% CI=1.207-5.869) compared to those with lower level of education.

Comment [P9]: Overall write up needs clarity and simplification

DISCUSSION

Majority of people that benefited from the eyecare outreach were females and this could have been due to better health-seeking behaviour that has been reported among women compared to men (16,17). In a study conducted among victims of trauma in Sweden, it was documented

that women with injury sought help earlier than men, hence this could mean their desire to seek help as early as possible, which is similar to whatwe found in this study where more women sought eye screening. Studies had reported that women in developing countries are less likely to seek formal healthcare and more likely to seek traditional care compared to their male counterparts (18,19), hence lack of decision making power and financial power to access formal, facility-based care may account for more female clientele utilization of free eye care services. While majority of respondents had a good knowledge of their previous eye health, poor knowledge of this was ironically found to be significantly associated with good overall knowledge about eye care. This means that individual's ignorance of their eye health status does not necessarily translate to their ignorance about other aspects/ components of eye care. They could have known how important eye screening is, how regular eye check is supposed to be done and even when a child should have first eye screening but not know the state of their own eyes due to other reasons that could have confounded this finding such as socio-economic status.

The attitude of respondents to eye care was found to be good and this was consistent with the findings of Onwubiko et al (13) done among rural dwellers in southeastern part of Nigeria. Hence, good attitude to eye care remains a common finding across regions and various population groups in Nigeria. Various studies have examined various components of knowledge of eye care; hence findings may vary not just based on the differences in methodology, but also differences in the domain of knowledge being assessed. This study reported majority of respondents in an urban slum in southwestern region of Nigeria to have good overall knowledge of eye care while poor overall knowledge was documented among rural dwellers in southeastern Nigeria (13). It is however notable that southeast study assessed overall knowledge based on respondents' knowledge of different eye disease while

this study based overall knowledge assessment on frequency of eye check, importance of eye check and time to have first eye check for a child.

With higher level of education, an individual is expected to have better knowledge of health-related matters, and even previous studies have found education to predict knowledge of eye care (13,20), however this study did not find any significant association between educational level and overall knowledge of eye care.

We found that the practice of eye care was poor among about a third of the respondents and this contrasted withthe finding of Achigbu et. al from a hospital-based study conducted among diabetes patients In Southeast Nigeria (21).Despite the study population being a group of people at higher risk of eye problem due to their medical condition, good eye care practice was reported by just a third of them. The diabetic patients could have considered their medical condition to be of greater priority to them and hence not see a need for eye check. Also, the burden of clinic attendance for the diabetes could have overwhelmed them and not giving them allowance (financial and psychological) to utilize any other health care services. This community-based survey could therefore have found a better practice of good eye care basically because of the difference in study population medical profile in addition to the socio-cultural and lifestyle practices due to location of participants. Respondents of this study with poor eye care practice however gave lack of knowledge of how often eye check should be done and not thinking eye check is important since they do not have complaint as part of the reasons for not having good eye care practice. This finding is a valid point among our respondents as only a tenth had good knowledge of how regular eye check should be done. A similar finding was reported by mothers of children in Benin city who believed that eye check is not necessary and therefore did not seek eye check for their children (22). Similarly, a study among the elderly who had access to NHS-funded eyecare in UK also found poor uptake of eye examination due to poor knowledge among the respondents (23). Though the

UK study found knowledge of purpose of eye test as one of the reasons for poor practice while this study found knowledge of regularity of eye test as one of the reasons, however, knowledge in different form was consistently identified as a reason for poor practice of eye care by both studies despite the difference in study population and location. Respondents with higher level of education were more likely to have both good attitude and practice about eye care, a finding that has also been found among population in India, southeast and southwestern Nigeria (13,20,24).

Majority of Lagos Island urban slum dwellers had good knowledge, attitude and practice of eye care but poor practice of eye care still exists among about one of every three persons, hence there is need to identify means to improve the uptake of practice of good eye care. This study has however identified poor knowledge as a major reason why people had poor practice and this should be addressed using various ways to enlighten the population on the rationale for routine eye check, Efforts at increasing access to quality education for all which is one of the goals of the sustainable development goal should be supported by all (public and private sectors) as this study has shown that in addition to other benefits of access to formal education, it could also help to achieve good attitude to eye care and also good eye care practices.

References

1. Vision Is Our Dominant Sense | BrainLine [Internet]. [cited 2022 Sep 4]. Available from: https://www.brainline.org/article/vision-our-dominant-sense
2. Ripley DL, Politzer T. Vision disturbance after TBI. Neurorehabilitation [Internet]. 2010 [cited 2022 Sep 4];27(3):215–6. Available from: https://www.brainline.org/article/vision-our-dominant-sense
3. World Health Organization. World report on vision. 2019.
4. Centre for Disease Control. Keep an Eye on Your Vision Health [Internet]. Vision Health Initiative. 2021 [cited 2022 Sep 4]. Available from: https://www.cdc.gov/visionhealth/resources/features/keep-eye-on-vision-health.html
5. WHO launches new guide on integrating eye care in health systems [Internet]. [cited 2022 Sep 4]. Available from: https://www.who.int/news/item/24-05-2022-who-launches-new-guide-on-integrating-eye-care-in-health-systems
6. Ajaiyeoba AI, Isawumi MA, Adeoye AO, Oluleye TS. Pattern of eye diseases and visual impairment among students in southwestern Nigeria. Int Ophthalmol. 2007 Oct;27(5):287–92.
7. Ukponmwan CU. Pattern of ocular morbidity in Nigeria. Asian Pac J Trop Dis [Internet]. 2013 Apr [cited 2022 Sep 4];3(2):164. Available from: /pmc/articles/PMC4027279/
8. World Health Organization. Eye care in health systems: Guide for action [Internet]. 2022. Available from: http://apps.who.int/
9. Ovenseri-Ogbomo G, Abokyi S, Koffour G, Abokyi E. Knowledge of diabetes and its associated ocular manifestations by diabetic patients: A study at Korle-Bu Teaching Hospital, Ghana. Nigerian Medical Journal: journal of Nigeria Medical Association. 2013 Aug;54(4):217–23.
10. Assem AS, Tegegne MM, Alemu DS, Woredekal AT, Tefera TK. Knowledge about diabetic retinopathy, eye check-up practice and associated factors among adult patients with diabetes mellitus attending at debark hospital, Northwest Ethiopia. BMC Ophthalmol [Internet]. 2020 Dec 1 [cited 2022 Sep 12];20(1). Available from: https://pubmed.ncbi.nlm.nih.gov/33208125/
11. National Population Commission. Report of Nigeria's National Population Commission on the 2006 Census. Popul Dev Rev [Internet]. 2007 [cited 2017 Jan 30];33(1):206–10. Available from: http://www.jstor.org/stable/25434601

12. Kirkwood BR, Sterne JAC. Essential medical statistics. Second. Blackwell Science. Oxford University Press; 2003. 512 p.
13. Onwubiko SN, Eze BI, Udeh NN, Okoloagu NN, Chuka-Okosa CM. Knowledge and Attitudes towards Eye Diseases in a Rural South-eastern Nigerian Population. J Health Care Poor Underserved [Internet]. 2015 [cited 2022 Oct 13];26(1):199–210. Available from: https://muse.jhu.edu/article/574208
14. Mberu BU, Haregu TN, Kyobutungi C, Ezeh AC. Health and health-related indicators in slum, rural, and urban communities: A comparative analysis. Glob Health Action. 2016;9(1).
15. American Academy of Pediatrics American Association of Certified Orthoptists American Association for Pediatric Ophthalmology and Strabismus American Ocademy of Ophthalmology Policy Statement. Eye Examination in Infants, Children, and Young Adults by Pediatricians. 2003.
16. Courtenay WH. Constructions of masculinity and their in¯uence on men's well-being: a theory of gender and health [Internet]. Available from: www.elsevier.com/locate/socscimed
17. Tenenbaum A, Nordeman L, Sunnerhagen KS, Gunnarsson R. Gender differences in care-seeking behavior and healthcare consumption immediately after whiplash trauma. PLoS One. 2017 Apr 1;12(4).
18. Vlassoff C. Gender Differences in Determinants and Consequences of Health and Illness. 2007.
19. Das M, Angeli F, Krumeich AJSM, van Schayck OCP. The gendered experience with respect to health-seeking behaviour in an urban slum of Kolkata, India. Int J Equity Health. 2018 Feb 14;17(1).
20. Shakya R, Ahlawat R, Ahluwalia NS, Kuyyadiyil S, Jain B, Shah C. Reasons for Delayed Presentation for Cataract Surgery in Patients of Lens Induced Glaucoma – A Questionnaire-based Study at a Tertiary Eye Care Centre of Central Rural India. https://doi.org/101080/0928658620212002914 [Internet]. 2021 [cited 2022 Oct 13]; Available from: https://www.tandfonline.com/doi/abs/10.1080/09286586.2021.2002914
21. Achigbu EO, Oputa RN, Achigbu KI, Ahuche IU, Achigbu EO, Oputa RN, et al. Knowledge, Attitude and Practice of Patients with Diabetes Regarding Eye Care: A Cross Sectional Study. Open J Ophthalmol [Internet]. 2016 May 4 [cited 2022 Oct 13];6(2):94–102. Available from: http://www.scirp.org/journal/PaperInformation.aspx?PaperID=66389
22. Amiebenomo O, Achugwo D, Abah I. Parental knowledge and attitude to children's eye care services. Niger J Paediatr. 2016 Jul 1;43(3):215.

23. Shickle D, Griffin M. Why don’t older adults in England go to have their eyes examined? Ophthalmic and Physiological Optics. 2014 Jan;34(1):38–45.
24. Olusanya BA, Ashaye AO, Owoaje ET, Baiyeroju AM, Ajayi BG. Determinants of Utilization of Eye Care Services in a Rural Adult Population of a Developing Country. Middle East Afr J Ophthalmol [Internet]. 2016 Jan 1 [cited 2022 Oct 13];23(1):96. Available from: /pmc/articles/PMC4759912/