

OPHTHALMIC PROBLEMS OF ADULTS IN RURAL COMMUNITIES OF RIVERS STATE, NIGERIA

ABSTRACT

Aim: To determine the ophthalmic problems and their possible causes among adults in some rural communities in Rivers State.

Comment [A1]: Not all communities were evaluated.

Methods: A multistage population based random sampling study of adults in five clans of Etche Local Government Area of Rivers State. Medical history was taken and comprehensive ocular examination done on each subject. Ocular examination included visual acuity, visual field, tonometry and ophthalmoscopy. Data taken were recorded and analysed using statistical software called Minitab 11. Ethical approval was obtained from Rivers State Ministry of Health.

Comment [A2]: Ethical approval was obtained from Rivers State Ministry of Health.

Results: Out of the 600 subjects seen in this study 276 (46.0%) were males and 324 (54.0%) females. They were all above 21 years old. Twenty six (2.4%) subjects had good vision while 8 (0.8%) were blind. The ophthalmic problems identified were Presbyopia 298 (28.0%), Refractive error 247 (23.2%), Cataract 126 (11.8%), Allergic conjunctivitis 106 (9.9%), Glaucoma 94 (8.8%), Pterygium 86 (8.1%), Bacterial conjunctivitis 35 (3.3%), Corneal opacity 32 (3.0%), Chalazion 4 (0.4%), Diabetic retinopathy 3 (0.3%) and Ptosis 1 (0.1%).

Conclusion: The most common ophthalmic problems in this study which were dependent on gender and occupation include Presbyopia, Refractive Error, Cataract and Allergic Conjunctivitis. More females and farmers were seen in this study. The problems identified can be easily managed if well-equipped health facilities are provided by the government.

Keywords: Ophthalmic problems, adults, rural communities, Rivers State.

INTRODUCTION

Comment [A3]: The purpose is not in the introduction, only in the abstract.

Ophthalmic problems are global and constitute serious public health challenges especially among older adults¹. According to Bethesda, the prevalence of blindness and visual impairment increases with age among all racial and ethnic groups, especially among people older than 75 years of age².

The World Health Organization estimated number of people with visual impairment worldwide is 285 million, while 39 million are blind and 246 have low vision³. About 81% of all people who are blind or have moderate to severe visual impairment are aged 50 years and above, indicating that with an increasing population of older people, more people will be at risk of visual impairment due to chronic eye diseases⁴. About 90% of the world's visually impaired live in low income settings and 80% of all visual impairment can be prevented or cured and over 90% of the world blind are in Sub Saharan African and Asia and especially among the persons in the rural communities⁵. Lawallen and Courtright reported the major causes of blindness in Africa as cataract, trachoma and glaucoma⁶. Blindness prevalence rates vary globally but evidence based study suggests that approximately 1% of Africans are blind and majority of the blindness in that region are preventable or curable⁶.

The Nigeria National blindness and visual impairment survey that was carried out in the year 2009⁷ showed that the major causes of blindness and visual impairment among adults in Nigeria were uncorrected refractive error, cataract and glaucoma. The survey also stated that increasing age was associated with increasing prevalence of all blinding conditions. According to the survey, 4.25 million adults aged 40 years and above have moderate to severe visual impairment or blindness. The prevalence of blindness in Nigeria is 0.78% attributed that to poor technology, minimal eye care services, malnutrition and poverty^{7,8}.

The commonest causes of blindness worldwide are cataract, glaucoma, trachoma, onchocerciasis and refractive errors⁹. Most of these blinding diseases are preventable and easily treatable but the majority of the victims in Africa and Asia are either poor, ignorant, or do not have eye -care services available to them¹⁰. Etche indigenes are predominantly farmers and farmers according to Momoh and Abadom are

50 usually exposed to certain occupational hazards that predispose them to ocular diseases and injuries¹¹.
51 Visual impairment obviously compromises people's quality of life because it makes them unable to read,
52 watch television, drive a car, operate machines or attend to themselves. Most times, it isolates older
53 people from friends and family which may lead to depression.
54 Ejimadu and Pedro-Egbe¹² in their study on prevalence and causes of Blindness in Ikwerre Local
55 Government Area of Rivers State revealed that the three top causes of blindness in that community were
56 cataract, Glaucoma, Optic Atrophy, Corneal Opacity, Phthisis Bulbi, Absent Globe, Chorioretinitis and
57 Maculopathy. They further concluded that most of these blinding eye diseases are avoidable; therefore
58 more emphasis on eye care should focus on prevention through public enlightenment and regular eye
59 screening with participation of the government. Also the prohibition of harmful traditional practices,
60 discouragement of self-medication, provision of basic eye care delivery and increasing cataract surgery
61 will reduce prevalence of blindness.

62 Our study seeks to determine the ophthalmic problems and their possible causes among adults in rural
63 communities in Rivers State

64

65 METHODOLOGY

66 A multistage population based random sampling study of adults in five clans of Etche Local Government
67 Area of Rivers State.

68 Medical history was recorded and comprehensive ocular examination done on each subject who was at
69 least 21 years after obtaining consent from them.

70 Instruments used during the research were Pen torch for examination of the external structures of the
71 eyes, Keeler ophthalmoscopes for fundus examination, Snellen's charts both literate or illiterate charts for
72 visual acuity assessment, Reichert AT 555 Auto non-contact tonometer for measurement of the intra-
73 ocular pressure and trial lens cases used for subjective refraction.

74 Data taken were analysed using statistical software called Minitab 11 where the raw data obtained were
75 classified into different groups and categories based on their common characteristics. The data were
76 logically represented, where raw data were summarized and displayed in a compact form that is statistical
77 tables.

Comment [A4]: To determine the ophthalmic problems and their possible causes among adults in rural communities in Rivers State.

78 An ethical approval to carry out the study was obtained from Rivers State Ministry of Health through the
 79 office of Planning, Research and Statistics. Afterwards a second approval was obtained from Rivers State
 80 Ethical Committee following due applications.

81 Inclusion criteria was adults in Etche local Government Area who were 21 years and above and was
 82 randomly selected at the sampling stage. It also involved those that signed the consent forms and were
 83 ready to participate.

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85

86

87 **RESULT**

88 **Table 1: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS**

Comment [A5]: The results only describe the data in the table. Does not use statistical test to make association between the data.

Comment [A6]: Configure table

89	AGE (YEARS)	MALE (%)	FEMALE (%)	FREQUENCY (%)
90	21-30	57 (9.5)	60 (10.0)	117 (19.5)
91	31-40	79 (13.1)	82 (13.6)	161 (26.8)
92	41-50	72 (12.0)	102 (17.0)	174 (29.0)
93	51-60	46 (7.6)	64 (10.6)	110 (18.3)
94	>60	22 (3.6)	16 (2.6)	38 (6.3)
95	TOTAL	276 (46.0)	324 (54.0)	600 (100)
96	OCCUPATION			
97	Civil Servants	81 (13.5)	71 (11.8)	152 (25.3)
98	Traders	52 (8.6)	50 (8.3)	102(17.0)
99	Farmers	115 (19.1)	161(26.8)	276(46.0)
100	Students	17 (2.8)	29(4.8)	46 (7.6)
101	Retirees	9 (1.5)	6(1.0)	15(2.5)
102	Unemployed	2 (0.3)	7(1.1)	9(1.5)
103	TOTAL	276 (46.0)	324(54.0)	600(100)

104 **P-value =0.015**

Table 1 shows the demographical characteristics of the respondents. Out of the 600 subjects seen in this study 276 (46.0%) were males and 324 (54.0%) were females. Their ages ranged from 21 years and above. The highest age group was 41-50 with 174 (29.0%) subjects, followed by age group of 31-40 years 161 (26.8%) while the smallest age group was >60years with frequency of 38 (6.3%).

The second segment of the table shows the occupational distribution of the subjects. Majority were farmers; 276 (46.0%) while others were civil servants 152 (25.3%), and traders 102 (17.0%), few students 46 (7.6%), Retirees 15 (2.5%) and unemployed 9 (1.5%).

112

TABLE 2: DISTRIBUTION OF OPHTHALMIC CONDITIONS OF SUBJECTS.

OCULO/VISUAL STATUS	FREQUENCY (N)	(%)
Presbyopia	298	28.0
Refractive Error	247	23.1
Cataract	126	11.8
Allergic Conjunctivitis	106	9.9
Glaucoma	94	8.8
Pterygium	86	8.0
Bacterial Conjunctivitis	35	3.3
Corneal Opacity	32	3.0
Good Vision	26	2.4
Blindness	8	0.8
Chalazion	4	0.4
Diabetic Retinopathy	3	0.3
Ptosis	1	0.1
Total	1066	100

Chi sq =196.985, df =20

Comment [A7]: Configure table

Table 2 summarizes the distribution of ophthalmic conditions of subjects. The most predominant oculo-visual condition was presbyopia (28.0%), followed by refractive error (23.1%) and cataract (11.8%). The least common conditions were chalazion (0.4%), diabetic retinopathy (0.3%) and ptosis (0.1%).

130

131 **Table 3: DISTRIBUTION OF COMMON OPHTHALMIC PROBLEMS WITH RESPECT TO**
132 **OCCUPATION.**

OCCUPATION	OCULO-VISUAL CONDITIONS (NO (%))					CATARACT	REFRACTIVE ERROR
	CATARACT	REFRACTIVE ERROR	PRESBYOPIA	ALLERGIC CONJUNCTIVITIS	PTERYGIUM		
CIVIL SERVANT	19 (15.1%)	128(51.8%)	146(49.0%)	15(14.2%)	10(11.6%)		
TRADERS	45 (35.7%)	22(8.9%)	50(16.8%)	18(17.0%)	16(18.6%)		
FARMERS	52 (41.3%)	57 (23.1%)	69(23.2%)	55(51.9%)	53(61.6%)		
STUDENTS	0 (0%)	31(12.6%)	10(3.3%)	12(11.3%)	3(3.5%)		
RETIREEES	8 (6.3%)	6(2.4%)	15(5.0%)	3(2.8%)	3(3.5%)		
UNEMPLOYED	2 (1.6%)	3(1.2%)	8(2.7%)	3(2.8%)	1(1.2%)		
TOTAL	126(100%)	247 (100%)	298(100%)	106(100%)	86(100%)		

Comment [A8]: Configure table

133 P-value = 0.0125

Table 3 shows the distribution of common ophthalmic problems with respect to occupation. Farmers (41.3%) presented more with cataract than other occupations. Civil Servants had more errors refractive (51.8%) than other groups. The highest prevalence of presbyopia occurred amongst Civil Servants (49.0%).

137

Table 4: GENDER –RELATED OHTHALMIC CONDITIONS IN SUBJECTS

Comment [A9]: Configure table

Ocular conditions	Gender No (%) Prevalence		
	Male	Female	Total
Presbyopia	158 (14.8%)	140 (13.1%)	298 (28.0%)
Refractive error	127 (11.9%)	120 (11.3%)	247 (23.1%)
Cataract	62 (5.8%)	64 (6.0%)	126 (11.8%)
Allergic	30 (2.8%)	76 (7.1%)	106 (9.9%)
Conjunctivitis			
Glaucoma	46 (4.3%)	48 (4.5%)	94 (8.8%)
Pterygium	42 (3.9%)	44 (4.1%)	86 (8.0%)
Bacterial	17 (1.6 %)	18 (1.7%)	35 (3.3%)
Conjunctivitis			
Corneal Opacity	21 (2.0%)	11 (1.0%)	32 (3.0%)
Good Vision	14 (1.3%)	12 (1.1 %)	26 (2.4%)
Blindness	5 (0.5%)	3 (0.3%)	8 (0.8%)
Chalazion 3 (0.3%)	1 (0.1%)	4 (0.4 %)	
Diabetic	3 (0.3%)	0 (0%)	3 (0.3%)
Retinopathy			
Ptosis	0 (0%)	1 (0.1%)	1 (0.1%)
Total	528 (49.5%)	538 (50.5%)	1066 (100%)

Chi Sq = 20.619, df = 4

158 Table 4 shows gender related ocular conditions seen in the subjects. Females presented more with allergic
159 conjunctivitis (7.1%), pterygium (4.1%) and cataract (6.0%) than males. While the male presented more with
160 refractive error (11.9%) and presbyopia (14.8%) than females.

161

UNDER PEER REVIEW

162 DISCUSSION

163 The ophthalmic problems found among adults in Etche LGA were Presbyopia 298 (28.0%), Refractive
164 Error 247 (23.1%), Cataract 126 (11.8%), Allergic Conjunctivitis 106 (9.9%), Glaucoma 94 (8.8%),
165 Pterygium 86 (8.1%), Bacterial Conjunctivitis 35 (3.3%), Corneal Opacity 3 (3.0), Chalazion 4 (0.4%),
166 Diabetic Retinopathy 3 (0.3%) and Ptosis 1 (0.1%). Twenty six (2.4%) subjects had good vision while 8
167 (0.8%) were blind. These findings are similar to studies by WHO⁴ that listed the common ocular diseases
168 worldwide as cataract, glaucoma, conjunctivitis, corneal ulcers, uveitis, refractive errors, pterygium,
169 trachoma, onchocerciasis, xerophthalmia and ocular malignancies. This is also similar to the study by
170 Edema and Okojie in a rural area in Ethiopia and Benin City where conjunctivitis, cataract, presbyopia,
171 refractive errors, glaucoma and blepharitis¹³.

172 Presbyopia was the most common type of ophthalmic problems found in our study, accounting for 28.0%
173 of all cases seen. This is similar to findings by Nwosu¹⁴

174 . The second most prevalent ophthalmic problem is Refractive Error 247(23.1%). According to WHO,⁴
175 uncorrected refractive errors are the most common cause of visual impairment accounting for 43% of
176 cases and representing an important cause of blindness¹⁵. The prevalence of refractive errors in this

177 study was higher in males than females which may be linked to the fact that majority of the males are
178 educated, in school or are civil servants which may be a contributory factor to the diagnosis of refractive
179 error or presbyopia. This was in agreement with a study which stated that the prevalence of refractive

180 errors vary with race, age, gender and geographical region and that environmental factors like level of
181 education, occupation, near work load, time of outdoors as a child are also associated with aetiology of
182 refractive error¹⁶. Uncorrected refractive error was the main cause of Low vision and second commonest
183 cause of blindness in a study which also revealed that uncorrected refractive error can hamper
184 performance at school, reduce employability and productivity, and generally impair quality of life¹⁵.

185
186 Uncorrected refractive error which was the commonest cause of ophthalmic problems in this study has
187 been reported as the commonest cause of ocular morbidity in another study¹⁷. It was the commonest cause

Comment [A10]: Realize value judgment.

188 of mild and moderate visual impairment in the Nigerian national blindness and visual impairment survey
189 accounting for 77.9% and 57.1% respectively^{7,18}.

190 We recorded cataract as the third most common type of ophthalmic problem accounting for 11.8% of all
191 cases which is similar to that of 16.7% reported from a study in Benin, Nigeria¹³. In a study on causes of
192 visual impairment and blindness in Kwara State of Nigeria¹⁹, Cataract was responsible for more than half
193 the cases of ocular morbidity and was the commonest cause of visual disability. The high rate of cataract
194 cases in the study is basically unknown but may be attributed to their constant exposure to ultraviolet
195 rays, firewood smoke, trauma, age group of the study area and poorly controlled diabetes since a lot of the
196 cataract patients reported to be diabetic.

197 The fourth commonest ocular problem reported in this study was Allergic Conjunctivitis with an
198 incidence of 9.9%. This is similar to other studies that reported Allergic Conjunctivitis as the third
199 leading cause of ocular morbidity with prevalence of less than 20%^{14,20}.

200 The high occurrence of allergic conjunctivitis in this study may be associated with higher pollen content
201 of the farming environment since they are basically farmers, this is related to a study by Momoh and
202 Abadon¹¹ where high rate of allergic conjunctivitis found in farming environment was linked to higher
203 pollen content of farming environment and also they postulated that allergic conjunctivitis may be
204 prevalent in a dusty environment.

205 Glaucoma is one of the common ocular diseases found in this study accounting for 8.8%. This is similar
206 to a study where Glaucoma was seen in 11.9% of patients¹⁷ and it has been reported to be the second
207 most common cause of blindness or visual impairment worldwide⁵. It is the leading cause of irreversible
208 blindness in West Africa and it has been estimated that 20% of people older than age 40 in West Africa
209 may be at risk from the disease¹⁷.

210 Pterygium is another prevalent ocular disease in this population with an incidence of 8.1%. This is
211 consistent with Momoh and Abadom¹¹ where incidence of pterygium was common among farmers but in
212 contrast in another study²⁰ that showed Pterygium as the second common eye disorder among the
213 welders in their study with a prevalence of 17.5

214 Corneal Opacity accounted for 3.0% in this study. This may be attributed to the fact that the majority of
215 the subjects are predominantly farmers and most of the subjects reported applying traditional medicine in
216 the eyes. Majority of the corneal opacity occurred as a result of trauma and traditional medical practices.
217 About 321(68.0%) respondents have never have any form of ocular trauma while 151(32.0%) respondents
218 reported of having at least one episode of ocular trauma but only 32(3.0%) subjects had corneal Opacity,
219 this may have connection with the majority indigene of the study area being predominately farmers. This
220 is in line with the global estimates that showed that there are about total of 1.6 million ocular trauma cases
221 of blindness and about 2.3 million ocular trauma from agricultural labour, also victims have less access to
222 eye care services than their urban counterparts, it is likely that rural people may have a greater burden of
223 vision impairment or blindness caused by trauma¹⁴.

224 In contrast with those of Wokoma and Ichenwo¹⁰ in rural community in Rivers State, Nigeria where a
225 lower occurrence of corneal opacities was reported (0.9%). The subjects being basically farmers had a
226 high occurrence of trauma-related visual problems (corneal opacity) which may be attributed to the fact
227 that they came directly in contact with occupational hazards such as dust, projectiles of organic
228 agricultural materials such as twigs and seeds and falling objects.

229 Surprisingly bacterial conjunctivitis (3.3%) showed to be an uncommon ocular problem in this study.
230 This is similar to the study by Momoh and Abadom¹¹ with incidence of 1.3%. Other rare ocular diseases
231 found in this study include chalazion 0.4%, diabetic retinopathy 0.3%, ptosis 0.1% and blindness 0.8%.

232 The distribution of blindness in this study showed that six subjects (75.0%) had mono-ocular blindness
233 while two subjects (25.0%) were bilaterally blind. The three causes of blindness in the subjects were

234 Glaucoma (25%), Cataract (50%) and Corneal Opacity / Trauma (25%). The incidence of blindness
235 (0.8%) may suggest poor or no availability of eye care services in the locality.

236 This study revealed significant relationship between the subjects' occupations and their common oculo-
237 visual problems. The majority of the subjects were mainly farmers 276 (46.0%), civil servants
238 152(25.3%) and traders 102 (17.0%). Civil Servants 128 (51.8%) and Students 31(12.6%) have the
239 highest prevalence on Refractive error/Presbyopia respectively. This may be attributed to their visual task
240 being higher than those in other occupation. This is similar to a study by Njepuome, Onyebuchi, and
241 Igbe²¹ that showed the pattern of oculo-visual problems among public / civil servants in Abuja as follows
242 refractive error 88.7%, Cataract 1.1%, Pterygium 2.3%, Disc cupping 3.4%, Chalazion 1.1% and
243 Conjunctivitis 3.4% where the ages of the subjects ranged from 25 years to 60 years and the study showed
244 refractive error as a leading cause of visual impairment among civil servants in Abuja. Farmers were
245 found to have the highest prevalence of Allergic Conjunctivitis (51.9%) and Pterygium (61.6%). This
246 may also be attributed to the nature of their occupation that is basically outdoor activities that expose
247 them to dust and ultra violet rays.

248
249 More so, the common ocular diseases prevalent among adults in our study are dependent on gender. The
250 adult females have the highest prevalence on Cataract 64 (50.8%), Allergic Conjunctivitis 76 (71.7%) and
251 pterygium 44 (51.2%) while Refractive Error 127 (51.4%) /Presbyopia 158 (53.0%) are more prevalent in
252 males. This may be associated to the fact that majority of their females are more exposed to farm related
253 activities while the males mostly do official works hence, have higher near visual tasks. This is in contrast
254 to similar studies in the same environment and in southern Nigeria where there were a higher proportion
255 of males to females and the male had a higher prevalence of Pterygium and allergic conjunctivitis in the
256 study by Edema and Okojie¹³. But this finding is similar to a study by Nwosu¹⁴ on rural young adults in
257 Anambra state whose predominant occupation was farming, in which there were more females than males
258 in the study and they had higher prevalence of allergic conjunctivitis than males. Nwosu (1998)

259 postulated that it was probably due to the rural- urban drift of more males than females. It is also similar
260 to a study by Wokoma¹⁰ in a rural community in Rivers State where the proportion of female participants
261 was higher than that of male and they also presented with higher rate of allergic conjunctivitis.

262 The absence of any form of eye care service in this community, no doubts contributed to the relatively
263 high prevalence of visual impairment. Eye diseases that would have been detected earlier and intervention
264 given, continue to persist and deteriorate, eventually progressing to blindness. None of the General
265 hospitals in our study area has any form of eye service. The available state owned hospitals that have eye
266 sections are at Port Harcourt, Okirika, Ahoadia and Bori. Unfortunately, the distance from our study area to
267 these facilities, the logistics and costs involved hinder majority from accessing quality eye services. The
268 greater majority remain in the community with their problem until they may become blind. The
269 observation in this rural community is not peculiar to Etche as similar observations have been reported in
270 other rural communities in the Nigeria^{10,22}. The causes of blindness in this study are preventable and
271 treatable if detected early.

272 CONCLUSION

273 The most common ophthalmic problems among adults in this study are Presbyopia, Refractive Error,
274 Cataract, Allergic Conjunctivitis and Pterygium and they accounted for more than two-third of the ocular
275 problems and are dependent on gender and occupation.

276 The lack of regular health education, inaccessibility of health facilities and the nature of their occupation
277 may be a contributing factor to the ocular diseases found in this study.

278 Also most of the subjects are predominantly farmers or combine their occupations with farming and this
279 may expose them to trauma, foreign body, dust or ultra violet rays that may pose ocular problems.
280 Regular screening, eye check and treatment of common eye diseases are highly recommended. The need

281 to wear protective eye devices such as goggles can reduce exposure to ultraviolet radiation and offer
282 protection against ocular injury.

283 The state Government should as well make eye care services available.

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