

1 **OPHTHALMIC PROBLEMS OF ADULTS IN RURAL COMMUNITIES OF**
2 **RIVERS STATE, NIGERIA**

3
4
5 **ABSTRACT**

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

Comment [A1]: Not all communities were evaluated.

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

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

13 **Results:** Out of the 600 subjects seen in this study 276 (46.0%) were males and 324 (54.0%)
14 females. They were all above 21 years old. Twenty six (2.4%) subjects had good vision while 8
15 (0.8%) were blind. The ophthalmic problems identified were Presbyopia 298 (28.0%), Refractive
16 error 247 (23.2%), Cataract 126 (11.8%), Allergic conjunctivitis 106 (9.9%), Glaucoma 94
17 (8.8%), Pterygium 86 (8.1%), Bacterial conjunctivitis 35 (3.3%), Corneal opacity 32 (3.0%),
18 Chalazion 4 (0.4%), Diabetic retinopathy 3 (0.3%) and Ptosis 1 (0.1%).

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

23 **Keywords:** Ophthalmic problems, adults, rural communities, Rivers State.
24

25 **INTRODUCTION**

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

29 The World Health Organization estimated number of people with visual impairment worldwide is
30 285million, while 39 million are blind and 246 have low vision³.About 81% of all people who are blind or
31 have moderate to severe visual impairment are aged 50 years and above, indicating that with an
32 increasing population of older people, more people will be at risk of visual impairment due to chronic eye
33 diseases⁴. About 90% of the world's visually impaired live in low income settings and 80% of all visual
34 impairment can be prevented or curedand over 90% of the world blindare in Sub Saharan African and
35 Asia and especially among the persons in the rural communities⁵.Lawallen and Courtright reported the
36 major causes of blindness in Africa as cataract, trachoma and glaucoma⁶Blindness prevalence rates vary
37 globally but evidence based study suggests that approximately 1% of Africans are blind and majority of
38 the blindness in that region are preventable or curable⁶.

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

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

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

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.

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

64 **METHODOLOGY**

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

67 Medical history was recorded and comprehensive ocular examination done on each subject who was at
68 least 21 years after obtaining consent from them. Ocular examination included visual acuity, visual field,
69 tonometry and ophthalmoscopy.

70 Data taken were analysed using statistical software called Minitab 11.

71 Ethical approval was obtained from Rivers State Ministry of Health.

Comment [A5]: The method of data collection and procedures for ethical research in research. Number 600 subjects

74 **RESULT**

Comment [A6]: The results only describe the data in the table. Does not use statistical test to make association between the data.

75 Table 1 shows the demographical characteristics of the respondents. Out of the 600 subjects seen in this study 276
 76 (46.0%) were males and 324 (54.0%) were females. Their ages ranged from 21 years and above. The highest age
 77 group was 41-50 with 174 (29.0%) subjects, followed by age group of 31-40 years 161 (26.8%) while the smallest
 78 age group was >60years with frequency of 38 (6.3%).

79 The second segment of the table shows the occupational distribution of the subjects. Majority were farmers; 276
 80 (46.0%) while others were civil servants 152 (25.3%), and traders 102 (17.0%), few students 46 (7.6%), Retirees 15
 81 (2.5%) and unemployed 9 (1.5%).

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

Comment [A7]: Configure table

83	AGE (YEARS)	MALE (%)	FEMALE (%)	FREQUENCY (%)
84	21-30	57 (9.5)	60 (10.0)	117 (19.5)
85	31-40	79 (13.1)	82 (13.6)	161 (26.8)
86	41-50	72 (12.0)	102 (17.0)	174 (29.0)
87	51-60	46 (7.6)	64 (10.6)	110 (18.3)
88	>60	22 (3.6)	16 (2.6)	38 (6.3)
89	TOTAL	276 (46.0)	324 (54.0)	600 (100)
90	OCCUPATION			
91	Civil Servants	81 (13.5)	71 (11.8)	152 (25.3)
92	Traders	52 (8.6)	50 (8.3)	102(17.0)
93	Farmers	115 (19.1)	161(26.8)	276(46.0)
94	Students	17 (2.8)	29(4.8)	46 (7.6)
95	Retirees	9 (1.5)	6(1.0)	15(2.5)
96	Unemployed	2 (0.3)	7(1.1)	9(1.5)
97	TOTAL	276 (46.0)	324(54.0)	600(100)

98

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

102 **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

Comment [A8]: Configure table

118
 119 Table 3 shows the distribution of common ophthalmic problems with respect to occupation. Farmers (41.3%)
 120 presented more with cataract than other occupations. Civil Servants had more errors refractive (51.8%) than other
 121 groups. The highest prevalence of presbyopia occurred amongst Civil Servants (49.0%).

122 **Table 3: DISTRIBUTION OF COMMON OPHTHALMIC PROBLEMS WITH RESPECT TO**
 123 **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%)		

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

Comment [A9]: Configure table

127

128 **Table 4: GENDER-RELATED OHTHALMIC CONDITIONS IN SUBJECTS**

Comment [A10]: Configure table

Ocular conditions	Gender No (%) Prevalence		
	Male	Female	Total

131	Presbyopia	158 (14.8%)	140 (13.1%)	298 (28.0%)
132	Refractive error	127 (11.9%)	120 (11.3%)	247 (23.1%)
133	Cataract	62 (5.8%)	64 (6.0%)	126 (11.8%)
134	Allergic	30 (2.8%)	76 (7.1%)	106 (9.9%)
135	Conjunctivitis			
136	Glaucoma	46 (4.3%)	48 (4.5%)	94 (8.8%)
137	Pterygium	42 (3.9%)	44 (4.1%)	86 (8.0%)
138	Bacterial	17 (1.6%)	18 (1.7%)	35 (3.3%)
139	Conjunctivitis			
140	Corneal Opacity	21 (2.0%)	11 (1.0%)	32 (3.0%)
141	Good Vision	14 (1.3%)	12 (1.1%)	26 (2.4%)
142	Blindness	5 (0.5%)	3 (0.3%)	8 (0.8%)
143	Chalazion	3 (0.3%)	1 (0.1%)	4 (0.4%)
144	Diabetic	3 (0.3%)	0 (0%)	3 (0.3%)
145	Retinopathy			
146	Ptosis	0 (0%)	1 (0.1%)	1 (0.1%)
Total		528 (49.5%)	538 (50.5%)	1066 (100%)

147

148 **DISCUSSION**

149 The ophthalmic problems found among adults in Etche LGA were Presbyopia 298 (28.0%), Refractive
150 Error 247 (23.1%), Cataract 126 (11.8%), Allergic Conjunctivitis 106 (9.9%), Glaucoma 94 (8.8%),
151 Pterygium 86 (8.1%), Bacterial Conjunctivitis 35 (3.3%), Corneal Opacity 3 (3.0), Chalazion 4 (0.4%),
152 Diabetic Retinopathy 3 (0.3%) and Ptosis 1 (0.1%). Twenty six (2.4%) subjects had good vision while 8
153 (0.8%) were blind. These findings are similar to studies by WHO⁴ that listed the common ocular diseases
154 worldwide as cataract, glaucoma, conjunctivitis, corneal ulcers, uveitis, refractive errors, pterygium,
155 trachoma, onchocerciasis, xerophthalmia and ocular malignancies. This is also similar to the study by
156 Edema and Okojie in a rural area in Ethiopia and Benin City were conjunctivitis, cataract, presbyopia,
157 refractive errors, glaucoma and blepharitis¹³.

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

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

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

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

171
172 Uncorrected refractive error which was the commonest cause of ophthalmic problems in this study has
173 been reported as the commonest cause of ocular morbidity in another study¹⁷. It was the commonest cause

Comment [A11]: Realize value judgment.

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

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

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

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

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

196 Pterygium is another prevalent ocular disease in this population with an incidence of 8.1%. This is
197 consistent with Momoh and Abadam¹¹ where incidence of pterygium was common among farmers but in
198 contrast in another study²⁰ that showed Pterygium as the second common eye disorder among the
199 welders in their study with a prevalence of 17.5

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

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

215 Surprisingly bacterial conjunctivitis (3.3%) showed to be an uncommon ocular problem in this study.
216 This is similar to the study by Momoh and Abadam¹¹with incidence of 1.3%.Other rare ocular
217 diseasesfound in this study include chalazion 0.4%, diabetic retinopathy 0.3%, ptosis 0.1% and blindness
218 0.8%.

219 The distribution of blindness in this study showed that six subjects (75.0%) had mono-ocular blindness
220 while two subjects (25.0%) were bilaterally blind. The three causes of blindness in the subjects were
221 Glaucoma (25%), Cataract (50%) and Corneal Opacity / Trauma (25%). The incidence of blindness
222 (0.8%) may suggest poor or no availability of eye care services in the locality.

223 This study revealed significant relationship between the subjects' occupations and their common oculo-
224 visual problems. The majority of the subjects were mainly farmers 276 (46.0%), civil servants
225 152(25.3%) and traders 102 (17.0%). Civil Servants 128 (51.8%) and Students 31(12.6%) have the
226 highest prevalence on Refractive error/Presbyopia respectively. This may be attributed to their visual task
227 being higher than those in other occupation. This is similar to a study by Njepuome, Onyebuchi, and
228 Igbe²¹ that showed the pattern of oculo-visual problems among public / civil servants in Abuja as follows
229 refractive error 88.7%, Cataract 1.1%, Pterygium 2.3%, Disc cupping 3.4%, Chalazion 1.1% and
230 Conjunctivitis 3.4% where the ages of the subjects ranged from 25 years to 60 years and the study showed
231 refractive error as a leading cause of visual impairment among civil servants in Abuja. Farmers were
232 found to have the highest prevalence of Allergic Conjunctivitis (51.9%) and Pterygium (61.6%). This
233 may also be attributed to the nature of their occupation that is basically outdoor activities that expose
234 them to dust and ultra violet rays.

235
236 More so, the common ocular diseases prevalent among adults in our study are dependent on gender. The
237 adult females have the highest prevalence on Cataract 64 (50.8%), Allergic Conjunctivitis 76 (71.7%) and
238 pterygium 44 (51.2%) while Refractive Error 127 (51.4%) /Presbyopia 158 (53.0%) are more prevalent in
239 males. This may be associated to the fact that majority of their females are more exposed to farm related
240 activities while the males mostly do official works hence, have higher near visual tasks. This is in contrast
241 to similar studies in the same environment and in southern Nigeria where there were a higher proportion
242 of males to females and the male had a higher prevalence of Pterygium and allergic conjunctivitis in the
243 study by Edema and Okojie¹³. But this finding is similar to a study by Nwosu¹⁴ on rural young adults in

244 Anambra state whose predominant occupation was farming, in which there were more females than males
245 in the study and they had higher prevalence of allergic conjunctivitis than males. Nwosu (1998)
246 postulated that it was probably due to the rural- urban drift of more males than females. It is also similar
247 to a study by Wokoma¹⁰ in a rural community in Rivers State where the proportion of female participants
248 was higher than that of male and they also presented with higher rate of allergic conjunctivitis.

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

259 **CONCLUSION**

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

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

265 Also most of the subjects are predominantly farmers or combine their occupations with farming and this
266 may expose them to trauma, foreign body, dust or ultra violet rays that may pose ocular problems. Regular

267 screening, eye check and treatment of common eye diseases are highly recommended. The need to wear
268 protective eye devices such as goggles can reduce exposure to ultraviolet radiation and offer protection
269 against ocular injury.

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

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