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ORIGINAL ARTICLE

Traditional Eye Medication: A Rural-Urban Comparison of Use and association with Glaucoma among Adults in Ilorin-west Local Government Area, North-Central Nigeria

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Keywords: Traditional eye medication; Glaucoma; Rural-Urban; Nigeria

ABSTRACT

Background: Globally, the last two decades witnessed increase in the use of Traditional Eye Medication (TEM); and its use worsens the prognosis of visual outcome. This study assessed and compared the use of TEM and its association with glaucoma among adults in selected rural and urban communities of Ilorin-west Local Government Area, North-Central Nigeria.
Methodology: This was a comparative cross-sectional study. Respondents were selected using multi-stage sampling technique. Interviewer-administered structured questionnaire, and clinical report form were used to collect data. Data were analyzed using SPSS version 15. Level of statistical significance was set at $p<0.05$.

Results: A higher proportion of the rural, 174 (38.7%) than the urban, 111 (24.7%) respondents knew about TEM ($p<0.001$). More of the rural, 83 (18.4%) than the urban, 78 (17.3%) respondents had ever used TEM ($p=0.664$). TEM known to the respondents in rural versus urban areas included camphor (47.1% vs 28.8%), personal urine (3.5% vs 2.7%) and salt-sugar solution (1.7% vs 14.4%) among others. There exists an association between the use of traditional eye medication and presence of glaucoma within rural ($p=0.011$) and urban ($p<0.001$) areas.

Conclusion: The use of TEM among the respondents was associated with glaucoma. While the association between glaucoma and uptake of TEM may not be causal, it provides a window of thought for further researches. There is need to strengthen awareness on the dangers of using TEM in the communities. Regular community-based eye screening involving measurement of intraocular pressure will be useful in early detection of glaucoma.

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INTRODUCTION

The eye is an external organ and it is particularly affected by the environment, probably more than any of the other organs in the body. Therefore, poor hygiene, climatic conditions, insect vectors and infection with microorganisms will significantly affect both

the burden and types of eye diseases in the community.[1] Among the diseases that affect the eye is glaucoma and it is the second leading cause of blindness after cataract.[2] Glaucoma, however, presents perhaps an even greater public health challenge than cataracts because the blindness it causes is irreversible.[3] Glaucoma is a group of optic neuropathy with characteristic visual field defect in which age above 40 years, race and raised intraocular pressure (IOP) are risk factors. The term glaucoma encompasses a group of ophthalmic diseases that are believed to share the common pathophysiology of elevated intraocular pressure (IOP) or abnormal sensitivity to high-normal IOP, resulting in damage to the nerve fiber layer of the retina and irreversible visual loss.[2] The two most common forms of the disease are primary open angle glaucoma (POAG) and primary angle closure glaucoma (PACG), with variable patterns of disease prevalence in different ethnic groups.[2]

Worldwide, the last two decades have witnessed a phenomenal increase in the prevalence of use of Traditional Eye Medication (TEM) with no sound scientific evidence to justify the use in treating eye diseases.[4] The resort to patronage of TEM has been variously attributed to ignorance, barriers to access primary eye care services, preference, failure of conventional treatment, desire to take control over medical treatment, communication gap between patients and orthodox eye care providers, and influence of friends and relations.[4] The use of harmful TEM before presentation in the hospital worsens the prognosis of visual outcome. A study conducted in Ado-Ekiti, Nigeria in 2009 to determine the prevalence of use of TEM in traumatic eye injury showed that 3.4% of the respondents applied various substances into the eyes after sustaining eye injury. Substances applied include kerosene (25%), cassava water (20.8%), breast milk (12.5%), personal urine (10.8%), and cow urine (8.3%).[5] Also, a study conducted between July 1, 2004 and June 30, 2008, at the University of Benin Teaching Hospital in Nigeria showed that rural dwellers were more likely to use TEM than urban dwellers ($p<0.0001$).[6] In the study, the common traditional medication used were plant extracts (54.9%) followed by concoctions (21.2%) and ocular complications occurred in 54.8% of the subjects with no significant difference in the type of medication and ocular complications ($p=0.956$).[6]

These traditional eye medications have diverse constituents some of which are corrosive and harmful to and could damage the eyes with possible glaucomatous changes and eventual blindness. In Nigeria, the situation of eye care accessibility is worse in remote rural areas inhabited by the poor who sometimes resort to the use of traditional eye medications. All these contribute to loss of sight among glaucomatous subjects in resource poor settings. Though, most health care facilities are concentrated in the urban areas, studies have shown that in both rural and urban populations, over 90% of the glaucoma patients were unaware of the condition.[7] This study therefore assessed and compared the use of TEM and its association with glaucoma among adults in selected rural and urban communities of Ilorin-west Local Government Area in North-Central Nigeria.

METHODOLOGY

Ilorin-west LGA is one of the sixteen LGAs in Kwara State, Nigeria. It is bounded in the North by Moro LGA, in the South by Asa LGA and in the east by Ilorin-east LGA. With a land mass of 54.2km^2 and its location between latitude $8^0$10′ and longitude $4^0$35′, it is situated in the transitional zone between northern and southern parts of Nigeria. The Local Government has 12 political wards and a projected population of 441,198.[8] The 10-year

projected population of adults (40 years and above) in Ilorin West LGA based on 2006 census is 96,876.[8] Ilorin-west LGA has four rural communities which are Wara-Oja, Egbejila, Osin and Ogundele communities located in the Wara/Osin/Egbejila ward. There are 11 urban wards with 18 communities some of which are Alanamu, Adabata, Isale-Aluko, Ita-ogunbo, Ita-kudimoh, Agaka, Ita-kure, Adewole, Ajikobi among others. Ilorin-West Local Government Area is a confluence of cultures with inhabitants that speak different languages which include Yoruba, Fulani, Nupe, Igbo and Hausa. The heterogeneous people that constitute the Local Government could be traced to the historical background of Ilorin emirate.

The use of traditional eye medications is a common practice among the people as some inhabitants often consult a traditional healer before presenting to the hospital. This is apart from the practice of self-medication and belief in supernatural forces as the cause of blindness, thus preventing early presentation to the hospital. These patronized traditional healers prefer the use of concoctions that cause irritation and pain because this is perceived as being potent. Some of the substances often used may be acidic or alkaline resulting in ocular burns. Worse still, no particular attention is paid to the content, concentration and mode of action as most of these concoctions are made, without recourse to hygiene, using contaminated water, local gin, saliva and even urine. Poverty, poor health seeking behavior, socio-cultural beliefs, and lack of access to specialized eye care services/health facilities are some of the common reasons for the persistence of this practice among the people of Ilorin-west LGA. The increasing worldwide interest in the use of herbal medicines could also be a factor as it presents an opportunity for easy access.

Ilorin-west LGA has a total of 20 public health facilities. This comprised two cottage hospitals, one General hospital owned by the Kwara State government, while the remaining 17 owned by the Local Government are a comprehensive health centre and 16 primary health centres. There is no specialized eye care service rendered in any of these hospitals, except the General hospital where there is a Consultant Ophthalmologist. Five of these health centres, one in each of the chosen rural and urban communities were used as fixed post for the ophthalmological examination/ screening. However, outside the Ilorin-west Local Government Area are the Kwara State Specialist Hospital, the Civil service clinic and the University of Ilorin Teaching Hospital where specialist eye care services can be accessed.

This was a comparative cross-sectional study. The study populations were adult men and women in the selected communities (four rural and one urban) of Ilorin-west LGA. The exclusion criteria used were age below 40 years with previous history of ocular surgery; visitors to the selected communities; those with red eye or other acute eye infection (e.g. conjunctivitis regardless of the cause) because the dilating agent for fundoscopy may worsen the symptoms; and adults with cornea or media opacity as it makes the fundus inaccessible/invisible. The minimum sample size for the study was determined using the formula for comparative study when comparing the means (intra-ocular pressure in rural μ_1 and urban μ_0 communities) of two independent groups. A total sample size of 300 (inclusive of 10% non- response) was obtained for each of rural and urban area However, because of the use of cluster design, a design factor of 1.5 was used to give 450 each for rural and urban area making an overall total of 900. [9, 10]

Multi-stage sampling technique with three stages was used. Simple random sampling technique by balloting was used to select one urban ward out of the 11 urban wards in Ilorin West LGA. Alanamu ward was selected. However, the only rural ward (Wara/Osin/Egbejila) was used in the study. Therefore, a rural and an urban ward were used for the study. Simple random sampling technique by balloting was used to choose a community from the three urban communities (Alanamu, Adabata and Isale-Aluko) that made up the selected urban ward. Alanamu community was randomly selected as the urban community. However, all the four (Wara-oja, Osin, Egbejila and Ogundele) communities in the only rural ward were used. In all, a total of five communities were used for the study.

The households in each community were delineated into enumeration areas (EAs). Each enumeration area demarcation has a cluster of 44 households. Alanamu community has a total of 38 EAs; Wara-osin 2EAs; Egbejila 3EAs; Osin-Aremu 4EAs while Ogundele has 2EAs. A total of 30 EAs were selected using simple random sampling by balloting from the 38 EAs in the urban community chosen. However, due to the sparse population in the rural communities and in order to meet the required sample size, 11 EAs in the four rural communities were selected. Cluster sampling technique was used to select the required number of respondents across the chosen enumeration areas. Each enumeration area was regarded as a cluster and all eligible and willing respondents in the households within the selected enumeration areas were recruited for the study until the required sample size of 450 each was attained for both the rural and urban communities. For households within an enumerations area where eligible respondents were not willing to participate or where there were no eligible respondent, the next household was visited to recruit subject.

Four research assistants were trained to participate in the study. The interviewer-administered questionnaire has three sections (socio-demographic characteristics; knowledge and use of various TEM among respondents). The questionnaire was translated into the local language (Yoruba) by an expert in Linguistics at the University of Ilorin for easy and uniform interpretation by the interviewers for respondents who do not speak English. The questionnaire was subsequently back translated by another Linguist into English language to ensure the meaning has not been lost. The questionnaire was pre-tested in Okelele community, another community located in Ilorin-east LGA with a view to detect deficiencies or ambiguities in the questionnaire. The intra-ocular pressure was measured using the Goldmann standard Perkins (hand-held) applanation tonometre (Haag-Streit^{R}), applanation prism, local anaesthetic drops, fluorescein strips and clean cotton wool or gauze swabs. Fundoscopy was done through the use of the ophthalmoscope. The light reflection in the examination room was lowered and respondents who are using glasses were asked to remove them. A multi-letter Snellen chart or E chart (for respondents with no formal education) was used to assess the respondents' visual acuity.[11] The values of the intra-ocular pressure and the fundoscopy findings were documented using the clinical report form as designed by the authors.

Diagnostic criteria for Glaucoma

Intra-Ocular Pressure: Values > 21mmHg; a difference of 4mmHg or more between the two eyes was considered as abnormal. Low or Normal IOP with visual field defect was regarded as normal tension glaucoma. High IOP with normal disc will be classified as Ocular Hypertension.[12]

Optic disc status: CDR (Cup-Disc Ratio) > 0.5.When there is evidence of glaucomatous optic nerve damage, that is, cupping of > 0.5. However, if there was no such evidence, the subject was classified as non-glaucomatous.[12]
Visual fields: Subjects with visual field defects suggestive of glaucoma was regarded as having glaucoma if there is either glaucomatous optic disc changes or high IOP.[12]

Ethical approval for the study was obtained from the Research and Ethical Committee of the University of Ilorin Teaching Hospital. Informed consent was obtained, signed or with a thumb print from the study subjects after the nature of the research was explained. Anonymity and confidentiality of results of the respondents was ensured. The respondents with abnormal intra-ocular pressure and or fundoscopy results were referred to Consultant Ophthalmologists for further assessment. All the referred respondents were tracked to ensure that they received the required treatment. Data collation and editing was done manually to detect omission and ensure uniform coding. The analysis was done using SPSS version 15.0 frequency tables and cross tabulations were generated. Bivariate analysis involving the use of Chi square test, odds ratio with 95% confidence interval were employed to analyze the variables.

RESULTS

A total of 450 respondents in each of rural and urban community participated in this study. As shown in Table 1, older respondents (≥60years) were slightly higher in the rural communities, 168 (37.3%), compared with the urban area, 157 (34.8%) where they made up 157 (34.8%). This observed difference in the age composition was however, not statistically significant (p=0.361). While more than three-quarters of the respondents in both rural, 430 (95.6%), and urban, 412 (91.6%), communities were Muslims, Christianity accounted for less than one-tenth of the respondents in each of the rural and urban areas. This observed difference was found to be statistically significant with a p value of 0.020 In Table 2, more than half, 258 (57.3%), of the rural respondents were traders compared with about one third, 171 (38.0%) in the urban area. There were more civil servants in the urban area, 185 (41.1%), compared with the rural area, 47 (10.4%). The observed rural-urban differences in the occupation was found to be significant (p<0.001).

As shown in Table 3, higher proportion of the rural (38.7%) than the urban (24.7%) respondents were aware of traditional eye medications (p<0.001). Some TEM known to the respondents in rural versus urban areas included camphor (47.1% vs 28.8%), personal urine (3.5% vs 2.7%) and salt-sugar solution (1.7% vs 14.4%) among others. Also, the rural dwellers, 83 (18.4%) who had ever used traditional eye medication for eye complaints were more than the urban dwellers, 78 (17.3%), (p=0.664). In Table 4, none of the rural respondents had ever used battery water as a local remedy for eye complaints compared with a total of 7 (1.6%) of the urban respondents who had ever used it (p=0.015). Almost three-quarters, 327 (72.7%), of the rural respondents had ever used traditional eye pencil for eye complaints compared with less than half, 212 (47.1%), among the urban respondents. More of the rural than the urban respondents are using traditional eye pencil ("*Tiro*") for eye complaints (p<0.001)

Table 5 showed that a total of 56 (12.4%); {(95%CI 9.4%-15.4%)} of the respondents in the rural areas were assessed to have glaucoma compared with 37 (8.2%; {(95%CI 5.7%-10.7%)} of the urban respondents with a p value of 0.037.

Table 1: Socio-demographic characteristics of respondents

Variable	Rural (n=450) n (%)	Urban (n=450) n (%)	χ^2	p-value
Age group (years)				
40-49	185 (41.1)	178 (39.6)		
50-59	97 (21.6)	115 (25.6)		
≥60	168 (37.3)	157 (34.8)	2.0	0.361
Sex				
Male	133 (29.6)	110 (24.4)		
Female	317 (70.4)	340 (75.6)	2.9	0.098
Marital status				
Married	329 (73.1)	309 (68.7)		
Widowed	96 (21.3)	108 (24.0)		
Single	17 (3.8)	20 (4.4)		
Divorced	6 (1.3)	12 (2.7)		
Separated	2 (0.5)	1 (0.2)	3.9	0.418
Level of Education				
No formal education	308 (68.4)	176 (39.1)		
Primary	61 (13.6)	30 (6.7)		
Secondary	52 (11.6)	46 (10.2)		
Tertiary	29 (6.4)	198 (25.2)	172.8	<0.001
Tribe				
Yoruba	435 (96.7)	438 (97.3)		
Hausa/Fulani	12 (2.7)	4 (0.9)		
Igbo	3 (0.6)	8 (1.8)	6.3	0.043
Religion				
Islam	430 (95.6)	412 (91.6)		
Christianity	20 (4.4)	38 (8.4)	5.9	0.020

Mean Age (Rural=53.6±11.7 years; Urban=54.3±11.6 years)

Table 2: Occupation, economic status and dependents of respondents

Variable	Rural (n=450) n (%)	Urban (n=450) n (%)	χ^2	p-value
Occupation				
Trading	258 (57.3)	171 (38.0)		
Civil servant	47 (10.4)	185 (41.1)		
Artisans/Farming	112 (24.9)	14 (3.1)		
Housewife	4 (0.9)	7 (1.6)		
Unemployed	29 (6.5)	73 (16.2)	195.8	<0.001
Average Monthly Income(₦)				
≤20,000	290 (64.5)	205 (45.6)		
21,000-40,000	64 (14.2)	64 (14.2)		
≥41,000	96 (21.3)	181 (40.2)	40.7	<0.001
Number of dependents				
≤5 dependents	224 (49.8)	272 (60.4)		
>5 dependents	226 (50.2)	178 (39.6)	10.4	0.001
Household main income earner				
Husband	134 (29.8)	189 (42.0)		
Wife	35 (7.8)	55 (12.2)		
Both	281 (62.4)	206 (45.8)	25.4	<0.001

Median income (rural =₦15, 000; urban=₦25,000)

Mean number of dependents (rural =6.2±3.9; urban=4.8±2.5)

Table 3: Knowledge and use of Traditional Eye Medication (TEM)

Variable	Rural n (%)	Urban n (%)	χ^2	p value
Awareness of any TEM	**n=450**	**n=450**		
Yes	174 (38.7)	111 (24.7)		
No	276 (61.3)	339 (75.3)	20.4	<0.001
Ever use TEM for eye complaints	**n=450**	**n=450**		
Yes	83 (18.4)	78 (17.3)		
No	367 (81.6)	372 (82.7)	0.2	0.664
Type of TEM known	**n=174**	**n=111**		
Camphor	82 (47.1)	32 (28.8)		
Plant extract/local concoction	63 (36.2)	31 (27.9)		
Traditional eye pencil-*"Tiro"*	10 (5.7)	22 (19.8)		
Breast Milk	11 (6.3)	11 (9.9)	42.0	<0.001
Salt-sugar solution	3 (1.7)	16 (14.4)		
Personal urine	6 (3.5)	3 (2.7)		
Cassava water	6 (3.5)	1 (0.9)		
Petrol	6 (3.5)	1 (0.9)		
Cow's urine	5 (2.9)	7 (6.3)		
Eye condition that can ever make you use TEM	**n=174**	**n=111**		
Inflammation	100 (57.5)	78 (70.3)		
None	98 (56.3)	5 (4.5)		
Poor vision	82 (47.1)	100 (90.1)		
Ocular trauma	35 (20.1)	65 (58.6)	129.3	<0.001
Foreign body	13 (7.5)	53 (47.8)		
Yellowness of the eye	12 (6.9)	30 (27.0)		

Table 4: Traditional Eye Medications (TEM) ever used for eye complaints by respondents

Type of TEM	Rural (n=450) Yes (%)	Urban (n=450) Yes (%)	χ^2	p value
Traditional eye pencil-*"Tiro"*	327 (72.7)	212 (47.1)	61.2	<0.001
Naphthalene balls/camphor	133 (29.6)	90 (20.0)	11.0	<0.001
Local herbs/concoction	88 (19.6)	69 (15.3)	2.8	0.095
Plant extract	61 (13.6)	41 (9.1)	4.4	0.036
Personal urine	18 (4.0)	24 (5.3)	0.9	0.343
Cassava water	16 (3.6)	7 (1.6)	3.6	0.057
Breast milk	14 (3.1)	19 (4.2)	0.8	0.375
Kerosene	6 (1.3)	8 (1.8)	0.3	0.590
Cow urine	5 (1.1)	7 (1.6)	0.3	0.561
Alcohol gin	4 (0.9)	9 (2.0)	1.9	0.163
Scarification marks	3 (0.6)	7 (1.6)	1.6	0.203
Battery water	0 (0.0)	7 (1.6)	7.1	0.015*
Soot	0 (0.0)	6 (1.3)	6.0	0.015*

*Fisher's exact test

Majority of the respondents in both rural and urban areas had unilateral glaucoma. Also, the strength of association between respondents' place of residence (rural versus urban) and the presence of glaucoma was found to have odds ratio of 1.6 (1.0-2.5) and a phi co-efficient, φ, of 0.069. As shown in Table 6, there exists an association between the use of traditional eye medication and presence of glaucoma within rural (p=0.011) and urban (p<0.001) areas.

Table 5: Prevalence of Glaucoma among the respondents

Variable	Rural n (%)	Urban n (%)	χ^2	p value
Glaucoma screening	**n=450**	**n=450**		
Glaucoma	56 (12.4)*	37 (8.2)*		
No glaucoma	394 (87.6)	413 (91.8)	4.3	0.037
	φ=0.069; OR=1.6 (1.0-2.5)*			
Lateralization of Glaucoma	**n=56**	**n=37**		
Unilateral	40 (71.4)	28 (75.7)		
Bilateral	16 (28.6)	9 (24.3)	0.2	0.831**
	OR=0.8 (0.3-2.3)*			

*12.4% (95%CI 9.4%-15.4%); (8.2%; {(95%CI 5.7%-10.7%)

φ=phi co-efficient; OR=Odds ratio (95%CI)*; **Yates correction

Table 6: Association between use of TEM and Glaucoma within rural and urban areas

Use of TEM	Prevalence of Glaucoma			
	Rural (n=450)		Urban (n=450)	
	Yes (%)	No (%)	Yes (%)	No (%)
Yes	18 (20.5)	70 (79.5)	15 (21.7)	54 (78.3)
No	38 (10.5)	324 (89.5)	22 (5.8)	359 (94.2)
	OR=2.19 (1.13-4.13)		OR=4.53 (2.09-9.00)	
	χ2=6.4; df=1; p=0.011		χ2=19.7; df=1; p<0.001	

OR=Odds ratio

DISCUSSION

In this study, the mean age of the respondents in the urban area (54.3±11.6) was slightly higher than that of the rural area (53.6±11.7) with a p value of 0.336. However, those who are ≥60 years were found to be slightly more in the rural area compared with the urban area as the erstwhile norm of elderly retiring to the villages to spend the rest of their lives after having worked to earn a living in the urban areas of the society for the most of their lives still subsists to some extent.

Also, the female respondents in this study were found to be more than the males in both the rural and urban communities (p=0.098). In our society, it is socio-cultural for men to go out and fend for their families while the women remain at home to take care of the children. More so, women have been found to be involved more in preventive/diagnostic health measures than the men.[13] These findings were also similar to that conducted among the elderly in Borno State, Nigeria, where the women were more than the men in the rural community studied.[14] Similarly, a study on awareness of glaucoma in an India rural and urban population and among healthcare workers in Ile-Ife, Nigeria also had more women than men participants.[7, 15, 16] However, this was different from what was obtained by other authors on the causes of blindness in people ≥50 years in a study of hospital versus community.[17] Though, the community study was in keeping with the result of this study, the hospital study differs possibly because the study focused on already blind respondents as against healthy respondents of this study. In another study in Southwestern Ethiopia on glaucoma awareness, males (69.7%) were found to be more than the females (30.3%).[18] However, because similar age group of ≥40 years used in this study was also targeted in the Ethiopia study, a replica mean age of 54.5±10.6 was also

obtained. A study in Canada on awareness and risk factors of eye diseases, also had more females (58.8%) compared with the male subjects (37.9%).[19] In a hospital-based study on incidence and complications of traditional eye medication (TEM) in Benin-city, Nigeria, though males (56.6%) were found to be more than the females (43.4%), the difference was also not statistically significant ($p>0.05$).[6]

Majority of the respondents in the rural communities and more than two-thirds in the urban community were married possibly because this study focused on adult respondents who, expectedly get married at adulthood. Expectedly, more than two thirds of the rural respondents in this study had no formal education compared with just about one-third among the urban subjects; however, about a quarter of the urban respondents had tertiary education. More educational facilities are concentrated in the urban compared with rural areas therefore people in urban communities probably had more opportunities for formal education.[20] This low literacy rate will have effect on the health-seeking behaviour of the rural subjects as they may not consider routine eye examination as being important and may even trivialize important health/ocular conditions. In a comparative study of socio-demographic determinants and fertility pattern among women in rural and urban communities in Southwestern Nigeria, it was found that there were more rural respondents with no formal education than the urban respondents.[21]

Though, more than one-third of the urban respondents were traders, civil servants were found to be the more in the urban area. Civil servants were more in the urban areas because the respondents were more educated; besides Kwara State has been severally referred to as a civil servant predominant state with the median income for the urban inhabitants being higher than that of the rural subjects. The higher median income of the urban respondents may be due to the fact that more of the respondents in the urban area were civil servants with a steady source of income. Socio-economic status is an important determinant of the likelihood that individuals and populations are exposed to environmental and other risk factors for health.[22] Socio-economic status also has effect on health-seeking behaviour as those with higher socio-economic status have better health-seeking behaviour compared with those with low socio-economic status. A study on socio-economic differences in the burden of disease in Sweden found that socio-economic inequalities in health were responsible for differential burden of diseases.[23]

The mean number of respondents' dependents was higher in the rural areas compared with the urban area and the difference was significant ($p<0.001$). Though, a higher proportion of the households sampled had both the husband and the wives as the income earner; only very few households in the study areas had only the wives as their household heads. This can be explained in both socio-cultural and religious terms. The study areas, being Yoruba speaking communities with rich socio-cultural heritage which place emphasis on maintaining and strengthening extended family ties, may explain the number of dependents. Also, a number of the urban residents send their wards to the rural villages to lend helping hands to their elderly parents in the rural areas. Islam, the most common religion in the study areas permits polygamy with attendant increase in the number of children given birth to. Also, both Yoruba culture and Islam place a moral responsibility on the men to provide for the household and be the household head. The harsh economic realities and the changing role of women in the society may explain the reason why there are households with both men and women as the

main income earner with the wives complementing the efforts of their husbands and vice versa as the case may be.

The rural dwellers used the traditional eye medication more than the urban dwellers, though the difference was not statistically significant (p=0.664). This was expected as the great majority of the rural respondents in this study were traders, artisans and other outdoor workers like farmers. These forms of work exposed them to trauma and a climate with predisposition to ocular conditions such as abrasions, lacerations, allergic and bacterial conjunctivitis. This is further compounded by poor educational attainment, poverty and lack of access to medical care. All these are predisposing factors for the use of traditional eye medications.[6] The same finding was obtained at the University of Benin Teaching Hospital, Benin city, Nigeria where rural dwellers were found to more likely use traditional eye medication than the urban respondents, but the Benin study found a significant difference (p<0.001) unlike this study.[6] This could be as a result of the hospital-based nature of the Benin study among patients with ocular complication of traditional eye medications. Hence, these patients are more likely to volunteer information than the healthy subjects of this study.

Although, less than a fifth of the respondents in both the rural (18.4%) and urban (17.3%) areas used local eye concoction/traditional eye medication, this was higher than the 3.4% obtained in Ado-Ekiti, Nigeria in a retrospective review of records of patients with history of ocular trauma who applied various substances into their eyes after sustaining ocular injury.[5] Substances applied to the eyes by the subjects, as reported by the Ado-Ekiti study, included Kerosene (25%), Cassava water (20.8%), breast milk (12.5%), personal urine (10.8%) and cow urine (8.3%). These values were higher than the values obtained in this study where 1.3% rural and 1.8% urban applied kerosene to their eyes. Similarly, only 3.6% rural and 1.6% urban respondents applied cassava water to the eyes in this study. This difference could be due to the fact that while the Ado-Ekiti study was a retrospective review of records of patients with traumatic eye injury, this study was conducted among apparently healthy subjects who probably may not have had previous ocular injury.[5]

The use of local eye concoction/traditional eye medication (TEM) was also found to be significantly associated with glaucoma within the rural and urban communities of this study.

These local eye medications have diverse constituents some of which are corrosive and harmful and could damage the eyes with possible glaucomatous changes and eventual blindness. Some of the substances used by respondents in this study include battery water, kerosene, breast milk, personal urine and cow's urine among others. In a similar study at the University of Benin Teaching Hospital, Benin City, Nigeria, in which the incidence and complications of traditional eye medications were studied, it was found that complications occurred in 54.8% of the 113 subjects evaluated.[6] These complications included corneal opacity, staphyloma, corneal ulcers among others with no significant difference between the type of TEM and the development of ocular complications (p=0.956).[5]

The commonest traditional eye medication ever used by the respondents in this study for ocular complaints was found to be the traditional/local eye pencil *("Tiro")* and its use was commoner in the rural than the urban area (p<0.001). Because "Tiro" is a Nigerian traditional eye preparation, this finding was therefore not unexpected as strong cultural

roots, tradition and customs are likely going to be more pronounced in the rural than the urban areas. Indeed, the use of traditional eye pencil (*"Tiro"-Antimony Sulphide/Stibnite*) is an age-long tradition among the people in the study area. In the same vein, more than a third, 38.7%, of the rural respondents had knowledge of traditional eye medications for local eye remedy compared with less than a quarter, 24.7%, of the urban respondents. Some of the conditions cited by respondents in both rural and urban areas that could make them use the traditional eye medications were majorly poor vision and inflammation. One limitation of this study is that data collected on the use of TEM were based on self-report from the respondents.

Conclusion

More of the rural respondents knew about TEM than the urban respondents and a variety of TEMs were being used in both rural and urban communities. More of the rural respondents had glaucoma compared with the urban respondents and majority of them have unilateral glaucoma. The study found an association between the use of TEM and glaucoma within the rural and urban areas.

Recommendations

The government at all levels, especially at the Local government level and non-governmental organizations need to scale-up the awareness and knowledge on the dangers of applying TEM to the eyes. This can be achieved through community-based awareness campaign so as to benefit the populace. The Government should develop a health policy on routine ophthalmological screening for glaucoma involving, but not limited to, measurement of intra-ocular pressure for all adult men and women from the fourth decade of life; and indeed for any age group at risk.

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