

Research Article

By : *K I M Muma^{1,3}, G Zulu¹, T Mumba – Malisawa¹, J I. M. Nyalazi¹, L Chinama – Musonda², G Syakantu³

¹University Teaching Hospitals Eye Hospital, Lusaka, Zambia

²Eye Department, Levy Mwanawasa University Teaching Hospital, Lusaka, Zambia

³School of Medicine and Health Sciences, Levy Mwanawasa Medical University, Lusaka, Zambia

*E-mail Addresses: Kangwa M. I. Muma: mkmuma@yahoo.com and drichengelo@gmail.com

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ABSTRACT

Aim: To assess the awareness and knowledge levels of glaucoma among eye patients attending the University Teaching Hospitals Eye Hospital.

Background: Awareness and knowledge on glaucoma can be vital in the fight against blindness due to glaucoma. Spread of knowledge regarding some well-recognized risk factors for glaucoma may encourage more awareness. For instance, a risk factor such as a positive family history of glaucoma, raises awareness because it encourages a search for more information regarding the disease and its assessment. **Methods:** This was a cross section study to assess the awareness and knowledge levels of glaucoma. A total of 1714 participants aged 18 to 98 years were recruited for the study. Respondents “having heard of glaucoma” even before they were contacted/recruited for the study were defined as “aware” and respondents having some understanding of the glaucoma disease were defined as “knowledgeable”.

Results: 1625 (94.8%) subjects completed a questionnaire that assessed their awareness and knowledge level of glaucoma. Overall 1,162 (71.5%; 95% CI: 70.7 – 73.9) participants were aware of glaucoma and 899 (55.3%; 95% CI: 51.3 – 72.1) had some knowledge about glaucoma. Awareness of glaucoma was not statistically significant in terms of age ($P=0.43$) and gender ($P=0.87$). Literate participants were four times more likely to be aware and seven times more likely to be knowledgeable than illiterate participants (P value < 0.001). The level of education had a significant association with both awareness and knowledge ($p=0.001$). In addition, participants who were related or known to glaucoma patients were more likely to be aware and knowledgeable than other participants (Odds ratio: 4.11; 95% CI: 2.12 – 5.45). Determinants of glaucoma awareness and knowledge were high-

er levels of education and family history of glaucoma.

Conclusion: Awareness and knowledge about glaucoma was fairly good among the eye patients attending the clinic at the University Teaching Hospitals Eye Hospital. Participants with lower levels of education were less aware and knew less about glaucoma than their counterparts with higher education levels. The study findings stress the need for health education and eye health promotion for effective prevention of blindness due to glaucoma.

Keywords: Awareness, glaucoma, knowledge

INTRODUCTION

Owing to the asymptomatic nature of glaucomatous progression, glaucoma may remain undetectable in most of the cases until it reaches an advanced stage [1]. This finding highlights the high burden of disease despite the existence of many effective treatments [1,2]. It is estimated that approximately 90% of glaucoma-related blindness is preventable with proper early treatment [3]. One of the most important and effective actions for early detection of glaucoma and its management may be raising public awareness and knowledge levels regarding the disease. Different levels of glaucoma awareness have been reported in different populations [4-9]. Published studies from developing countries indicate low levels of awareness, [4-6] while those from developed countries suggests higher levels of awareness [7-9]. Spread of knowledge regarding some well-recognized risk factors for glaucoma may encourage more awareness. These include a positive family history of glaucoma, which is associated with higher glaucoma awareness [5,7,10]. This is because the presence of this risk factor encourages a search for more information regarding the disease and its assessment. The rela-

tives have been reported as an important source of information regarding glaucoma [11]. However, a high awareness level does not indicate that the individual has complete knowledge regarding glaucoma or enough understanding of the disease. For example, several studies indicate that most individuals do not have an accurate understanding of this disease despite being aware of this disease [6-9]. Almost 40% of the study participants had inadequate knowledge of glaucoma [11].

In describing the changing dynamics regarding HIV infection patterns in Zambia, Michelo et al. (2006) argues that “lifestyles, cultural practices and communication patterns may significantly differ by educational attainment. However, whenever change happens, it does most probably begin with the higher educated groups [12]. This could therefore explain the lower risk levels of glaucoma seen among higher educated groups. On the other hand, we are aware that there is no other study that has made this observation on the association of education and prevalence of POAG, thereby this study endeavouring to do that

MATERIALS AND METHODS

Study area and population

A cross sectional survey of 1,714 participants aged 18 to 98 years old was conducted on POAG at the UTHs Eye Hospital in Lusaka, Zambia. The UTHs Eye Hospital is the national referral eye hospital which provides ophthalmological surgical and clinical services. The UTHs' Eye Hospital is estimated to cater for more than 21,000 clients annually for both routine and morbidity driven health care. The clients that attend this clinic come from across the country and include both self- and system-referrals, representing all age groups and all ethnic groups.

A systematic random sampling using 50% - time sampling was employed

which meant that of the 220 (on average) eye patients seen in the outpatient eye clinic every month, 110 were to be picked to participate in the study. This translated to a minimum 1320 participants to be recruited into the study for a period of twelve months. To cater for attrition and assuming a response rate of 80%, the sample size of the study pegged at 1,714 participants. Only 1625 (94.8%) eye patients consented to study participation of which 309 had glaucoma.

General awareness regarding glaucoma among patients was assessed using the following broad questions:

- i. If they had previously heard of glaucoma
- ii. If they were aware of glaucoma running in families
- iii. If they knew about the role of intra ocular pressure in causing glaucoma
- iv. If the visual loss due to glaucoma is irreversible or not and that it causes blindness
- v. If they were aware of any treatment modalities available for glaucoma.

We defined "awareness" as having heard about the disease. Awareness was accordingly classified. Having glaucoma knowledge was classified based on the other responses provided for the questions above.

Ethical statement

The University of Zambia Biomedical Research Ethics Committee approved the study (reference number 013-08-12). Further approval was obtained from Ministry of Health of Zambia through the UTH

RESULTS

Of the 1,714 patients, 89 (5.2%) did not accept to be in the study due to various reasons. Therefore, a total of 1,625 people were screened giving a 94.8% response rate.

Table 1: Gender distribution of participants; N = 1625

Factor	Description	Proportion (%)	Odds Ratio (95% CI)
Sex	Male	46.4	1
	Female	53.6	4.2 (2.1, 7.2)

Most of the participants were females 871 (53.6%) versus 754 (46.4%) male participants ($p=0.789$), [Table 1]. The age range of participants was 20 to 98 years with a mean age being 51 years.

Table 2: Awareness of glaucoma; glaucoma patients vs non-glaucoma patients N=1625

Glaucoma awareness	Yes (%)	Total Yes Average (%)	P - value
Glaucoma patients (n=309)	275 (89.0)	1,162 (71.5)	0.033
No glaucoma patients (n=1,316)	887 (67.4)		

Awareness was statistically different ($p=0.033$) between the glaucoma patient and the non-glaucoma one, Table 2.

A total of 1,162 (71.5%; 95% CI: 70.7 - 73.9) participants were aware of glaucoma and 899 (55.3%; 95% CI: 51.3 - 72.1) had some knowledge about glaucoma (Tables 2 and 3).

Awareness of glaucoma was not statistically significant in terms of age ($P=0.43$) and gender ($P=0.87$). Literate participants were four times more likely to be aware and seven times more likely to be knowledgeable than illiterate participants (P value < 0.001). The level of education had a significant association with both awareness and knowledge ($p=0.001$). In addition, participants who were related or known to glaucoma patients were more likely to be aware and knowledgeable than other participants (Odds ratio: 4.11; 95% CI: 2.12 - 5.45).

A total of 199 (12.2%; 95% CI: 10.4 - 17.5) participants understood the risk of familial predisposition to glaucoma. Awareness about the irreversible nature of vision loss

in glaucoma was noted in 331 (20.4%; 95% CI: 17.9 - 25.8) of the respondents.

Five hundred and fifty-one (33.9%; 95% CI: 28.1 - 38.3) responded that glaucoma could be treated and 625 (38.5%; 95% CI: 37.2 - 40.4) new that glaucomatous eyes could become blind. Interestingly, 826 (50.8%; 95% CI: 44.7 - 56.7) of the respondents believed that glaucoma was the same as trachoma.

One hundred and fifteen respondents (7.1%; 95% CI: 3.9 - 10.4) considered that screening could prevent glaucoma, but

only 517 (31.8%; 95% CI: 27.9 - 36.1%) had undergone screening/consulted an ophthalmologist in the previous year. Source of information for 343 (21.1%; 95% CI: 17.4 - 24.7) participants was 'word of mouth' from family or friends. Another 1,031 (63.4%; 95% CI: 59.1 - 68.3) participants had received information from visiting hospitals, medical personnel, eye camps or other healthcare recourses. Mass media was source of information for 251 (15.4%; 95% CI: 11.9 - 20.2) of the participants.

No associations were found between gender and awareness or knowledge of glaucoma ($p=0.765$) or age ($p=0.875$). 258 (76.3%; 95% CI: 72.1 - 79.3) participants were aware of glaucoma and the same number (258) of participants had some knowledge about glaucoma (Tables 1 and 2). There was a positive association between glaucoma awareness and education level ($p<0.0001$).

DISCUSSION

The study looked at awareness and knowledge of glaucoma in patients with glaucoma and those without glaucoma. The process of behavior changes, which culminates in action and maintenance, requires awareness and knowledge as its starting point [13]. Glaucoma is a highly prevalent ocular disease with a natural course that ultimately leads to blindness as compliance with treatment may improve with excellent patient knowledge and awareness. It may also lead to awareness among the patients' relatives and encourage them to participate in screening programmes. Low levels of awareness of glaucoma highlight the need for public education regarding this disease. It was discovered that knowledge regarding this condition was insufficient in both the glaucoma patients and those without glaucoma. Early diagnosis and institution of treatment can result in reduction of visual impairment and blindness, as the main predictor of eventual blindness is a late presentation of the disease.

Awareness was defined as having heard about the disease. Our results indicate that 89.0% of patients with glaucoma and 67.4% of those without glaucoma were aware of glaucoma. The most striking result from our study is that only 89.0% of the cases (patients with) of glaucoma were aware of the disease. The glaucoma knowledge was high (64.5%) in our study compared to studies from Australia and India who respectively reported that 29% and 40.6% of the participants had knowledge regarding glaucoma [14,15]. This difference with our study may be attributed to the slightly high literacy rate in the country which stands at 63.4% [16]. There are some differences in awareness of glaucoma in different areas and nations. For instance, a study from Melbourne, Australia, reported awareness of glaucoma in 76% of the general population, while a population-based study from Nepal reported a very low (2.4%) level of glaucoma awareness [4,17]. In a study in Barbados, 51% of participants with glaucoma were unaware of their diagnosis compared to our study where 53.6% were aware of their diagnosis [18]. The 71.5% observed level of glaucoma awareness in this study is consistent with the data in published reports from the United States, which indicate that 70–93% of participants attending eye clinics have heard about glaucoma [7,19,20]. In another sur-

vey from Australia, 93% of 3,654 adult study participants had awareness regarding glaucoma [14].

Costa et al. (2006) and associates assessed and compared awareness regarding glaucoma in two groups of study participants. One group consisted of high level of educated American patients with glaucoma, while the other comprised low level of educated Brazilian patients with glaucoma. The authors found significant differences between these two groups and concluded that differences in educational level lead to this disparity [21]. In this study, the high number of participants with secondary and tertiary education may have led to the high rate of glaucoma awareness. This correlates well with national literacy levels which stands at over 60%. The findings of a study conducted by Gogate and colleagues from India are consistent with this idea. In that study, which found lower levels of glaucoma awareness, most study participants were less educated [22]. Our results indicate that level of education is the strongest explanatory variable for glaucoma awareness.

In describing the changing dynamics regarding HIV infection patterns in Zambia, Michelo et al. (2006) argues that "lifestyles, cultural practices and communication patterns may significantly differ by educational attainment. However, whenever change happens, it does most probably begin with the higher educated groups [12]. Therefore, the lower risk levels of glaucoma seen among higher educated groups may be a stage of progression. On the other hand, we are aware that there is no other study that has made this observation on the association of education and prevalence of POAG, thereby calling for additional observational studies on this factor. In addition, the glaucoma patients should also be encouraged to persuade their relatives to seek glaucoma-screening examinations. Certainly, this would lead to early diagnosis of the glaucoma in the relatives.

Patients who were unaware of their diagnosis were most probably unaware of the possibility of glaucoma being a heritable disease. In this study, only 199 of 1,625 (12.2%) participants believed that a positive family history was a risk factor for glaucoma. This may indicate the necessity of urgent action regarding patient knowledge of glaucoma and the need to provide patients with useful information regarding

inheritance of glaucoma. Lack of awareness regarding heritability of glaucoma has been reported to vary from 21% to 68% [11,23]. Deokule and associates found that 41% of patients with glaucoma were aware of a risk for glaucoma in their family members, even though 45% of their family members were not screened for glaucoma [24]. Therefore, providing information to patients with glaucoma regarding the heritability of glaucoma and necessity of screening of their family members is crucial. This would encourage patients to inform their family members regarding the prognosis of glaucoma and their higher chance of being affected by this blinding disease compared to the general population. To achieve this, clinicians should periodically ask their patients about the awareness of their relatives regarding their diagnosis and whether their family members have participated in glaucoma screening examinations. The slightly low level of knowledge among the patients and non-patients highlights the importance of education for enhancing overall knowledge of glaucoma. This knowledge may encourage these individuals to seek glaucoma-screening examinations and help reduce the number of severe cases of this blinding condition.

In a study from Germany, participants' relatives were the main sources of information regarding glaucoma [25], while mass media was found to be the main source of information in a study from India [1]. In the current study, study participants declared that close acquaintances were their main source of information. Our observations may be due to selection bias, as all of our study participants were hospital recruited. This should be considered when interpreting the results of our study.

There are inconsistent findings regarding the relationship between gender and awareness of glaucoma. In a few studies from various countries, lack of glaucoma awareness was associated with male gender [13,26], while the opposite has been reported in other studies [4,27]. Other studies found no gender differences associated with knowledge or awareness of glaucoma [14,25,28]. This study equally found the same.

CONCLUSIONS

The awareness and knowledge levels of glaucoma were fairly low. These findings suggest that there is a need for health education in this Zambia population to

increase their level of awareness and knowledge of glaucoma. Education level was found to be a predictor of knowledge and awareness of glaucoma. Inadequate knowledge in the general population may be an important cause for failure to detect glaucoma early and may result in blindness from the disease.

RECOMMENDATIONS

Community sensitization and education would be an effective and feasible public health strategy to enhance knowledge and awareness of glaucoma, especially among individuals with a family history of the disease. This approach may ultimately reduce loss of vision due to glaucoma.

As awareness about glaucoma can lead to early detection, a very important step in preventing glaucoma-related blindness; [29] similarly educating masses will be cardinal in improving awareness. Furthermore, there is a need to identify interventions that reinforce people's attitude above the perceived level of awareness about glaucoma and to devise strategies that can influence behavior to the risk of blindness from glaucoma.

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