

Awareness of Glaucoma and Associated Factors among Adults in Sekela District, Northwest Ethiopia

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Research Article

Keywords: Awareness, Glaucoma, Sekela, Ethiopia

Posted Date: December 13th, 2018

DOI: <https://doi.org/10.21203/rs.2.70/v1>

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Version of Record: A version of this preprint was published at BMC Ophthalmology on January 6th, 2020.

See the published version at <https://doi.org/10.1186/s12886-019-1295-7>.

Abstract

Background

Awareness of glaucoma is directly affected by good eye screening practice which in turn helps for reduction of the blindness burden of glaucoma. However, it is unknown in the study area, making provision of interventions difficult. This study was intended to assess awareness of glaucoma and associated factors among adults in Sekela district, Northwest Ethiopia.

Methods

A population based cross - sectional survey was conducted on 602 adults who were selected by using systematic random sampling from April to May, 2018. Data were entered into Epi Info version 7 and was analyzed by statistical package for social sciences version 23. The adjusted odds ratio with 95% confidence interval was calculated to find out the strength of association. P-value ≤ 0.05 was considered statistically significant.

Results

A total of 594 adults were participated with a response rate of 98.7%. Nearly 52% of adults were females with median age of 28 years. The proportion of awareness of glaucoma was 24.4% [95% CI; 21.0, 28.1]. It was positively associated with educational status: primary education [AOR: 3.15; 1.72, 5.77], secondary education [AOR; 3.11: 1.66, 5.84], college and above [AOR; 6.10; 2.80, 13.27], history of eye examination [AOR: 6.52; 3.46, 12.25], income level: > 2000 Ethiopian birr [4.65; 2.59, 8.37] and history of chronic diseases [AOR; 2.93: 1.25, 6.85].

Conclusion

About one fourth of adults were aware of glaucoma and it was low. Higher educational status, eye examination, history of chronic diseases and better income level were significantly associated with awareness of glaucoma.

Background

Glaucoma is a group of disease characterized by progressive optic neuropathy and visual field defect(1). The occurrence of glaucoma is affected by the level of intra ocular pressure(IOP), race, age and inheritance(1, 2). Among these intra ocular pressure is the only modifiable risk factor(1).

Globally, 15% of blindness is due to glaucoma and about 600,000 people go blind annually(3). Africa accounts for 15% worlds blindness burden due to glaucoma(4). It is the fifth common cause of blindness in Ethiopia which results an irreversible sight loss for an estimated 62,000 Ethiopians(5, 6).

The impact of sight lose from glaucoma has profound implications both for the person affected and for the society as whole(7). The increasing prevalence of glaucoma is expected to cause a significant economic burden and poor quality of life.

High glaucoma morbidity among some African communities may be attributed to low trained professionals, low awareness, under-utilization of eye care service as well as limited availability of treatment procedures (8-10). It has been estimated that half of glaucoma patients are already blind in at least one eye in presentation in Africa(11). The situation is worse in sub Saharan Africa where it is further compounded by poor awareness in the region(12).

Improving community awareness early is a key means of addressing its devastating consequences by enhancing people alertness, increasing regularly eye screening practice which in turn helps to identify undetected cases(6). Contrary to this, lack of awareness appeared to influence self-care practices negatively(13).

According to different literatures reviewed educational status(9, 11, 14-17), age(10, 14, 18), sex(9, 15, 16), income level(19), history of chronic diseases(20), history of eye examination(9, 11, 14) and positive family history of glaucoma(15, 16, 20) were the most repeatedly associated factors with awareness of glaucoma.

It is well known that awareness leads to knowledge and knowledge to behavior of eye check-up practice(21). However, there is limited information regarding awareness of glaucoma and associated factors in the area. Therefore, it was valuable to calculate the proportion of awareness of glaucoma and associated factors. The finding of this study helps to develop strategies that can address these undersupply and unmet needs.

Materials And Methods

Study setting and population

A population based cross-sectional study design conducted in Gish Abay town of Sekela district on 602 adults from April to May, 2018. Gish Abay, which is located 463km from Addis Ababa, is the capital of Sekela district in West Gojjam administrative zone. All adults ≥ 18 years were included in the study.

Sample size determination

The entire sample size for awareness of glaucoma by taking proportion of aware of glaucoma $p=35.1$ (14) was 602, which was determined using single population proportion formula with the

assumption of 95% confidence interval ($Z_{\alpha/2} = 1.96$), 4% margin of error (w), 10% non-response rate (additional file 1).

Sampling procedure

Systematic random sampling technique was used to select households by using sampling fraction. The sampling fraction was determined by taking the ratio of households (8883) to the sample size i.e. 14. Finally, one eligible adult was selected from each household using simple random sampling/ lottery method if more than one adult was living in the house.

Data collection tool and procedure

A structured questionnaire adapted from previously published studies(10, 14-17, 20, 21) was utilized. It was initially prepared in English, translated into Amharic (local language) and re translated to English to check consistency in meaning of words and concepts. The questionnaire included background information, clinical characteristics and questions to measure awareness of glaucoma (additional file 2). The data were collected through face to face interview by five trained BSc optometrists.

Operational definition

Awareness: awareness was measured when a participant responded “yes” to the question ‘have you ever heard of glaucoma’ and choose at least one answer among the alternatives which explains the condition as ‘glaucoma is high eye pressure’, ‘glaucoma is high eye pressure causing blindness’, ‘glaucoma causes damage to the eye nerve’, ‘blinding eye disease causing eye nerve damage, eye disease causing visual field loss’(10) or similar answers when asked.

Data management and analysis

After checking for clarity and completeness, data were entered into Epi Info 7 and exported into statistical package for social science/SPSS version 23 for analysis. Both descriptive and analytical methods were employed for analysis. The descriptive parts of the data were summarized using measures of central tendency and dispersion.

Binary logistic regression model was used to identify factors which were associated with glaucoma awareness. Variables were fitted into the model by using the enter method. Hosmer and Lomeshow model fitness were checked. Multi-collinearity between the independent variables were also checked by tolerance and variance inflation factor (V.I.F). Adjusted odds ratio with 95% confidence interval was used to identify the significant factors. A $p\text{-value} \leq 0.05$ was considered statistically significant.

Results

Socio-demographic characteristics

A total of 594 adults were participated with a response rate of 98.7%. The median (IQR) age was 28 years [22-45]. About 308 (51.9%) of the respondents were females. Majority 359 (60.4%) of the participants had no formal education (Table 1).

Table 1: Socio-demographic and socio-economic characteristics of the study participants in Sekela district, Northwest Ethiopia, Jun 2018 (n=594)

Characteristics Frequency Percent

Sex

Female 308 51.9

Male 286 48.1

Age

18-22 169 28.5

23-27 144 24.2

28-45 140 23.6

≥ 46 141 23.7

Religion

Orthodox 586 98.7

Others* 8 1.3

Ethnicity

Amhara 584 98.3

Oromo 10 1.7

Level of education

No formal education 359 60.4

Primary education 101 17.0

Secondary education 90 15.2

College and above 44 7.4

Marital status

Single 275 46.3

Married 288 48.5

Divorced 14 2.4

Widowed 17 2.9

Type of occupation

Farmer 156 26.3

Government employee 48 8.1

Merchant 185 31.1

House wife 72 12.1

Job seeker 64 10.8

Others** 69 11.6

Monthly income

≤ 750 298 50.2

751-1300 115 19.4

1301-2000 62 10.4

≥ 2001ETB 119 20

Others* Muslim and Catholic; Others** = students, driver, religious leader

Clinical characteristics

About 43(7.2%) of adults had chronic diseases either diabetes mellitus or hypertension or both and around 74(12.5%) of adults had history of eye examination at least once in life. Twenty-four (4%) of adults had positive family history of glaucoma and about 10(1.7%) of the participants had positive history of glaucoma.

Awareness of glaucoma

One hundred ninety-two (32.3%) of the participants had heard of glaucoma. However, only 145 (24.4%) [95% CI: 21.0, 28.1] of them were aware of glaucoma.

Factors associated with awareness of glaucoma

In the multivariable analysis after adjusting for age, sex and ethnicity: history of eye examination, educational status, level of income and positive history of chronic diseases either diabetes mellitus or hypertension or both were significantly associated with awareness of glaucoma.

The odds of being aware of glaucoma among adults with primary education [AOR: 3.15; 95%CI:1.72, 5.77] and secondary education [AOR; 3.11, 95%CI:1.66, 5.84] were three times greater than those without formal education. Similarly, the odds of being aware of glaucoma among adults who had college and above education were about six [AOR; 6.10, 95%CI:2.80, 13.27] times greater than their counterparts.

The odds of glaucoma awareness among adults with history of eye examination were 6.5[AOR: 6.52, 95%CI:3.46, 12.25] times greater than their counterparts.

The odds of being aware of glaucoma among adults with positive history of chronic diseases either diabetes mellitus or hypertension or both were nearly three [AOR; 2.93, 95%CI: 1.25, 6.85] times greater as compared to their counterparts.

Furthermore, the odds of being aware of glaucoma among adults with higher income level (\geq 2001) were 4.6 [AOR; 4.65, 95%CI: 2.59, 8.37] times greater than those adults with lower income levels (Table 2).

Table 2: Factors associated with awareness of glaucoma among adults in Sekela district, Northwest Ethiopia, Jun 2018(n=594)

Awareness of glaucoma

Variables	Yes	No	COR(95% CI)	AOR(95%CI)
Age category				
18-22 years	35	134	1.00	1.00
23-27years	43	101	1.63(0.97, 2.73)	1.27(0.70, 2.29)
28-45years	45	95	1.81(1.08, 3.03)	1.60(0.85, 3.02)
\geq 46 years	22	119	0.70(0.39, 1.27)	0.57(0.25, 1.28)

Sex

Male 84 202 1.00 1.00

Female 61 247 0.59(0.41, 0.86) 0.79(0.50, 1.25)

Educational status

No formal education 56 303 1.00 1.00

Primary education 32 69 2.50(1.51, 4.16) 3.15(1.72, 5.77)***

Secondary education 33 57 3.13(1.87, 5.24) 3.11(1.66, 5.84)***

College and above 24 20 6.49(3.36, 12.54) 6.10(2.80, 13.27)***

Ethnicity

Amhara 140 444 1.00 1.00

Oromo 5 5 3.17(0.90, 11.11) 0.62(0.12, 3.20)

Income level/ETB

≤750 34 264 1.00 1.00

751-1300 35 80 3.39(1.99, 5.79) 2.44(1.34, 4.43)**

1301-2000 21 41 3.97(2.10, 7.51) 3.50(1.73, 7.06)**

≥2001 55 64 6.67(4.01, 11.08) 4.65(2.59, 8.37)***

Eye examination

No 98 422 1.00 1.00

Yes 47 27 7.49(4.44, 12.63) 6.52(3.46, 12.25)***

Chronic diseases

No 121 430 1.00 1.00

Yes 24 19 4.48(2.37, 8.46) 2.93(1.25, 6.85)*

Where, * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; 1.00= reference; CI= Confidence Interval; COR= crude odds ratio; AOR= adjusted odds ratio

Discussion

The proportion of awareness of glaucoma was 24.4% (95% CI: 21.0, 28.1). This finding is lower than the reports from Gondar, Northwest Ethiopia (35.1%)(14) and Addis Ababa(28.4%), Central Ethiopia(17). This might be due to the differences in educational status between the study participants. The study in Gondar showed that only 32.7% of adults had no formal education where as in this study more than half (60.2%) of adults had no formal education. From previous studies educational status is the significant predictor for awareness of glaucoma(9, 11, 14, 15, 17, 22).

This finding is also lower than the reports from Ghana (39.3%)(18), Nepal (60.6%)(22), Puducherry, India (45%)(20), Tehran, Iran (46.6%)(23), Birmingham, UK (67%)(24) and Philadelphia, USA (73%)(11). This might be due to differences in socio-demographic and socio-economic status and participants from developed countries(UK, USA) will access or utilize eye care services easily and will be occupied by health insurances(13). The other possible explanation for this discrepancy might be the way we measure awareness is quite different. For the above studies a participant said to be aware of glaucoma if the participant only had heard of glaucoma whereas in this study after heard of glaucoma the participant must give at least one possible and plausible explanation which defines the condition.

However, the current level of glaucoma awareness is better as compared to from the report of Agaro town in Jimma (2.4%), Southwest Ethiopia(10). This might be due to the age difference among study participants. In the later study, the participants had average age 54.5 years as compared to 28 years in this study. Previous studies showed older age demonstrated less awareness of glaucoma(11, 14, 17, 20, 25).

This finding is also higher than reports from Ghana (3.6%)(26), Nepal(2.43%)(27), urban India (13.5%)(15), 2.3%(28) and rural parts of India (0.32%)(29), (8.3%)(21). This might be the age difference among study participants: 50 years in Ghana(26), 55 years in Nepal(27), 54 years(15) in urban Chennai whereas 28 years in this study.

On the other hand, the finding of the present study is in line with a study from Ebonyi state, Nigeria (21.1%)(16) and Switzerland (24.7%)(30). This might be due to the same study setting. This could be also the age difference of the respondents was almost similar (28 vs 31years).

Higher educational status was found an important factor for awareness of glaucoma. This was supported by different literatures(9, 11, 14, 15, 17, 26). This might be due to health related information transmission is higher as educational status increases(17, 19, 20, 31, 32) and similarly educated adults do self-reading on personal health related materials. And this might be also due to educated adults seek modern medicines as their first choice whereas those adults without formal education need it at the last after they tried traditional medicines and failed which in turn affects their level of awareness.

History of eye examination was found another important factor for awareness of glaucoma(9, 11, 14). This might be due to the fact that adults coming for eye examination will attend health education programs and will familiarize the condition.

Adults with positive history of chronic diseases either diabetes mellitus/hypertension or both were positively associated with awareness of glaucoma(20). This might be due to the fact that this portion of adults have regular eye check-up which in turn helps them to familiarise the disease.

Better income level was also found an important determinants for awareness of glaucoma(19, 20, 25, 26, 29, 31). This might be due to adults with higher levels of income can afford and seek medical attention more than their counterparts.

Conclusion

About one fourth of adults were aware of glaucoma and it was low. Higher educational status, eye examination at least once in life, positive history of chronic diseases either diabetes mellitus or hypertension or both and higher income level were positively associated with awareness of glaucoma.

Declarations

Consent for publication

Not applicable.

Availability of data and materials

The dataset used and or analysed during this study are available from the corresponding author upon a reasonable request from Mr. Zewdu Yenegeta (contact address: zewduyenegeta@gmail.com).

Competing interests

We, the authors, declare that no any competing interests.

Funding

None.

Authors' contributions

ZYB designed and conceptualized the study from proposal development to manuscript writing. AT, YA and FA critically reviewed and add their comments in the paper. All authors read and approved the final manuscript.

Acknowledgements

We would like to acknowledge all participants of the study who kindly volunteered to answer to the interview. Our gratitude also goes to data collectors for their tireless work during data collection.

Ethics approval and consent to participate

Ethical clearance was obtained from University of Gondar Ethical Review Committee and letter of permission was obtained from Sekela district Administrative Office. During proposal write-up we already described to take oral informed consent since the study had no any invasive technique/procedure i.e. we only used a hard-copy structured questionnaire. After assessing the proposal carefully, the Ethical Review Committee approved as ethically sound research and permitted us to conduct this study. The study participants were informed about the purpose of the study and their right to refuse and withdraw the study at any time. Confidentiality was also maintained by excluding identifiers and using codes. Glaucoma related information were given orally for all study participants after completion of the interview.

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