

# Awareness and Knowledge of Glaucoma and their Associated Factors among Staffs in a Tertiary-level Hospital in Central Nepal

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## ABSTRACT

### Background

Since glaucoma-related blindness may only be prevented with early identification and treatment, finding asymptomatic individuals in the target population is critical. It is thus important to determine the awareness and knowledge on glaucoma.

### Objective

To determine the knowledge and awareness on glaucoma among the staff of a tertiary level hospital in central Nepal.

### Method

This was a cross sectional study among the staffs of Dhulikhel Hospital who participated voluntarily in the study. The data was collected through the administration of semi-structured questionnaires. R version 4.0.3 (2020-10-10) was used for the data analysis. Categorical variables are presented as frequency (percentages) and the numerical ones are presented as mean (standard deviation). Adjusted odds ratio (AOR) with 95% confidence interval were estimated through logistic regression analysis for determining factors associated with awareness and knowledge of glaucoma.

### Result

A total of 107 (89.2%) participants had heard about glaucoma of which 93 (86.9%) had good knowledge and 14(13.1%) had poor knowledge on glaucoma. The mean score of knowledge was 64.1±16.9. Only 47.7% of the participants said that glaucoma also has an asymptomatic course. We could not find an association of awareness and knowledge of glaucoma with any of the selected sociodemographic variables.

### Conclusion

Although there was a fairly good glaucoma related awareness and knowledge among hospital staff, we found lack of understanding on some critical issues on glaucoma, mainly related to its asymptomatic nature. There is thus room for improvement in educating about glaucoma even in healthcare settings. Given the necessity of expanding glaucoma awareness in the public, hospital staff might potentially serve as messengers to the communities

## KEY WORDS

*Awareness, Glaucoma, Hospital Staffs, Knowledge, Practice*

## INTRODUCTION

Globally glaucoma is one of the leading aetiologies of blindness.<sup>1</sup> It is the second leading cause of blindness, affecting about 70 million people globally.<sup>1,2</sup> Early detection of glaucoma is critical for appropriate care and prevention of blindness. However, this has been a challenging task because it is asymptomatic in the initial stage, and simple, easily-implementable screening tools are limited.<sup>3</sup> Hence almost 50-90% of the glaucoma patients remain undiagnosed worldwide and a large number of cases are diagnosed during late phase of disease.<sup>4-7</sup> One of the main reasons for the late presentation of glaucoma is inadequate awareness.<sup>8,9</sup> Since glaucoma-related blindness may only be avoided with early identification and treatment, finding asymptomatic people in the target population is the most critical step.<sup>10</sup> People must, however, be knowledgeable of glaucoma and the benefits of early identification and treatment in order to present to eye care providers.

There will be continuation of rise in glaucoma cases worldwide owing to the increasing life expectancies across the world. Glaucoma is therefore expected to be among the top three causes of irreversible blindness in the world.<sup>11-13</sup> Hence, enhancing global awareness is more critical than ever. If timely screening and prompt treatment are instituted, it is estimated that almost 90% of blindness related to glaucoma can be prevented or treated.<sup>13</sup>

There is dearth of information on glaucoma knowledge, awareness and practice in Nepal. Some studies have assessed glaucoma knowledge and awareness among the general population.<sup>14,15</sup> However, to our knowledge there has not been any study done among hospital staff. Hospital staff can help make public aware about glaucoma and also link to care and screening. This is only achievable if they themselves are aware and knowledgeable of glaucoma. Thus, we aimed to conduct a survey to assess the level of glaucoma awareness and knowledge among health workers at a tertiary care hospital of Nepal.

## METHODS

This was a cross-sectional study among staff of Dhulikhel Hospital (DH) from April 2021 to July 2021. DH is a tertiary-level hospital in central Nepal with the catchment population from Sindhupalchowk, Kavre, Sindhuli, Bhaktapur, Ramechhap and adjoining districts.

We sent a google form link to the staff of Dhulikhel Hospital through the corresponding department heads. Based on their self-report, those who met eligibility criteria were recruited and were used in final analysis. The inclusion criteria included a) staff of Dhulikhel Hospital, b) greater than or equal to 18 years, and c) agreeing to provide informed consent to participate in the study.

Ethical approval was obtained from the Institutional review committee (IRC) of Kathmandu University School of

Medical Sciences.

We used Cochran's formula for sample size calculation.<sup>16</sup> The prevalence of awareness of glaucoma was assumed to be 76.1%, based on a prior study.<sup>17</sup> We considered for 5% level of significance, 10.0% absolute error, and 10% non-response rate. This led to a minimal sample size of 77. However, we recruited 122 health workers conveniently so that sub-group analyses could also be done.

We collected data using an online survey using google forms, links distributed through viber, facebook and whatsapp. The data collection tool comprised of four components- socio-demographic characteristics, awareness and knowledge level of glaucoma, and practices on glaucoma screening.

Age, gender and education were included as socio-demographic characteristics. We defined awareness of glaucoma as "having heard of glaucoma" when they were asked if they had ever heard of glaucoma.

We assessed the knowledge regarding glaucoma based on the responses to a set of 16 questions on glaucoma. We coded correct and incorrect answers as one and zero respectively. The score was calculated by calculating percentage of total correct answers out of all responded questions of a participant. Good knowledge was considered as having the score more than or equal to the mean score and poor knowledge was considered as scores less than the mean score.

We used R version 4.0.3 (2020-10-10) for statistical analysis. Parametric numerical variables were presented as mean and standard deviation, and categorical variables as frequency and percentage. We used logistic regression (univariate and multivariate) for determining the association of age, gender, education and previous ocular examination with awareness and knowledge of glaucoma. Odds ratio (both crude and adjusted) and their 95% confidence interval (CI) were estimated.

## RESULTS

Of total 122 respondents, 120 (98.4%) participants agreed to respond. The age of the participants was from 23 years to 53 years (mean: 31.5). Of total participants, 72.5% were females, 55.8% were from Newar ethnic groups and 43.3% had education masters and above.

A total of 107 (89.2%) participants reported having heard about glaucoma. The most important sources of information about glaucoma were from the media (hospital and health personnel). A total of 3 (2.8%) participants had been diagnosed with glaucoma.

Table 3 presents the awareness of glaucoma (heard: yes/no) and its association with socio-demographic variables. We could not find any association of awareness with socio-demographic variables.

**Table 1. Sociodemographic Characteristics of the Participants (n=120)**

Characteristics	N (%)
Age (in years) mean±SD	31.5±7.2, min=23.0, max=53.0
<b>Gender</b>	
Male	33 (27.5)
Female	87 (72.5)
<b>Ethnicity</b>	
Brahmi/chhetri	42 (35.0%)
Newar	67 (55.8%)
Others	11(9.2)
<b>Education</b>	
Secondary (nine to twelve grade)	23 (19.2%)
Higher (Bachelor)	45 (37.5%)
Highest (Masters and above)	52 (43.3%)

**Table 2. Awareness, examination and family history, source of information of glaucoma**

Variables	n (%)
Heard about Glaucoma	107 (89.2%)
Ocular Examination in past one year	31 (25.8%)
Positive history of Glaucoma in family (n=107)	14(13.1%)
<b>Sources of Information (multiple response) (n=107)</b>	
Hospital/ health personnel	95(88.8)
TV/radio/newspaper	34(31.8)
Social media	37(31.8)
Eye camps/screening camps	37(34.6)
Family/Relative/Friends	24(22.4)
Diagnosed of glaucoma	3 (2.8%)

Table 3 presents the awareness of glaucoma (heard: yes/no) and its association with socio-demographic variables. We could not find any association of awareness with socio-demographic variables.

Table 5 presents the association of glaucoma knowledge with socio-demographic variables. None of the selected sociodemographic variables were associated with the knowledge of glaucoma in univariate and multivariate logistic regression analysis.

Table 6 presents knowledge on glaucoma treatment among those who said treatment is possible. A total of 62% of the participants identified eye drops as treatment of glaucoma, 46% identified Laser treatment and 87% identified surgery as the treatment methods. Blindness was identified as a consequence of absence of treatment of the glaucoma by 80% health care workers whereas 17% identified eye-damage as the consequence.

## DISCUSSION

This study aimed to assess the awareness and knowledge level of glaucoma among the staffs of a tertiary level

**Table 3. Association of awareness of glaucoma with socio-demographic factors**

Variables	Aware-ness about glaucoma, n (%)	COR (95%CI)	p-value	AOR	p-value
<b>Age (in years)</b>					
		1.03 (0.95-1.13)	0.462	1.01 (0.90-1.14)	0.857
<b>Gender</b>					
Male	27 (81.8)	1			
Female	80 (92.0)	2.54 (0.79-8.22)	0.120	2.61 (0.78-8.71)	0.120
<b>Education</b>					
Secondary (9-12)	19 (82.6)	1			
Higher sec(Bachelor)	40(88.9)	1.68 (0.41-6.99)	0.473	1.53 (0.35-6.75)	0.574
Highest(masters and above)	48(92.3)	2.53 (0.57-11.15)	0.221	2.04 (0.34-12.21)	0.435
<b>Ocular examination in the past</b>					
Absent	77(86.5)	1			
Present	30(96.77)	4.68 (0.58-37.54)	0.147	4.23 (0.51-35.31)	0.183

hospital in Nepal. Although some studies have examined glaucoma awareness and knowledge among Nepalese, to our knowledge this study is the first of its kind to be done among the staff of a hospital.<sup>14,15</sup>

The level of awareness of glaucoma in this study was high (89.2%) among the staff of a tertiary level hospital in Nepal. Of those who had heard about Glaucoma, 86.9% had good knowledge and 13.1% had poor knowledge on glaucoma. The awareness and knowledge levels of the participants on glaucoma in this study is high in comparison to studies conducted in the Africa region.<sup>18-20</sup> Glaucoma awareness has been observed to be low in developing countries, both in community-based research and among patients attending hospital or eye camps.<sup>21-25</sup> On the contrary, studies in the developed countries have found that high glaucoma awareness.<sup>10,26</sup> Despite the high knowledge of glaucoma among the study participants, there is a serious concern regarding the response on symptomatology of glaucoma. Almost half of the participants (52.3%) did not know that glaucoma might have an asymptomatic course. This is very alarming because the key to prevent blindness due to glaucoma is timely screening. Lack of awareness regarding the asymptomatic nature of glaucoma might lead to delayed seeking of eye care when there already is irreversible damage. Similar lack of understanding of asymptomaticity of glaucoma was seen in other studies as well. In a study conducted in Nigeria, only 18.5% of the respondents knew that glaucoma could be asymptomatic in the early stages.<sup>18</sup>

**Table 4. Knowledge about Glaucoma among participants who heard about glaucoma (n=107)**

Items	Yes n(%)	No n(%)	Don't Know n (%)
<b>Symptoms of Glaucoma</b>			
Glaucoma has asymptomatic course	<b>51 (47.7)</b>	33 (30.8)	23 (21.5)
Decrease in peripheral vision	<b>69 (64.5)</b>	38(35.5)	
Pain in eyeball	<b>57 (53.3)</b>	50(46.7)	
Redness of eye	<b>46 (43.0)</b>	61(57.0)	
Watering of eye	27 (25.2)	<b>80(74.8)</b>	
Discharge in eye	8 (7.5)	<b>99(92.5)</b>	
Increase pressure in eye	<b>101 (94.4)</b>	0 (0.0)	6 (5.6)
Damage to the nerve of eye due to increase in eye pressure	<b>98 (91.6)</b>	1 (0.9)	8 (7.5)
Damage to retina	<b>74 (69.2)</b>	13 (12.1)	20 (18.7)
Risk of Glaucoma increase with age	<b>92 (86.0)</b>	9 (8.4)	6 (5.6)
Glaucoma has familial predisposition (runs in family)	<b>74 (69.2)</b>	12 (11.1)	21 (19.6)
Vision is affected in early course	38 (35.5)	<b>55 (51.4)</b>	14 (13.1)
Glaucoma is same as cataract	5 (4.7)	<b>93 (86.9)</b>	9 (8.4)
Blindness from glaucoma is irreversible?	<b>70 (65.4)</b>	15(14.0)	22(20.6)
Blindness from Glaucoma is preventable?	<b>82 (76.6)</b>	12 (11.2)	13 (12.1)
Treatment of Glaucoma is possible?	<b>101 (94.4)</b>	2 (1.9)	4 (3.7)

Correct answers in bold

In a study from Eastern Nepal conducted among eye camp patients, almost 61% had heard about glaucoma. Glaucoma awareness was significantly associated with higher levels of family history of glaucoma, education, and history of eye check-up.<sup>15</sup> Our study did not show any statistically significant difference among the age groups, gender, education and ocular examination status. However, the level of awareness in this study was higher compared to the community-based study in Bhaktapur, where just 2.43% had glaucoma awareness.<sup>23</sup> This might be because of the study population. In this study, we selected staff from clinical settings, most of whom have a basic understanding of medical terminology, while the previous studies conducted in Nepal were performed in general populations.<sup>15,23</sup>

Glaucoma is a common preventable cause of blindness, and due to its extended duration of asymptomatic state, the sole effective strategy for blindness prevention from glaucoma is early detection. One of the key causes for glaucoma’s late presentation is the lack of awareness.<sup>8,9</sup> This leads to increased risk of blindness.<sup>27</sup> Health counseling and education remain important tools for lowering morbidity associated with most chronic illnesses,

**Table 5. Association of knowledge of glaucoma with socio-demographic factors**

Variables	Good knowledge, n (%)	COR (95%CI)	p value	AOR	p value
<b>Age (in years)</b>		0.96 (0.89-1.03)	0.242	1.00 (0.90-1.11)	0.966
<b>Gender</b>					
Male	22 (81.5)	1		1	
Female	71 (88.8)	1.79 (0.54-5.91)	0.338	2.36 (0.64-8.66)	0.195
<b>Education</b>					
Secondary (9-12)	17 (89.5)	1			
Higher sec(Bachelor)	38 (95.0)	2.24 (0.29-17.22)	0.440	2.27 (0.28-18.43)	0.445
Highest (masters and above)	38 (79.2)	0.45 (0.09-2.26)	0.331	0.37 (0.05-2.56)	0.316
<b>Ocular examination in the past</b>					
Absent	65 (84.4)	1		1	
Present	28 (93.3)	2.59 (0.54-12.31)	0.233	2.86 (0.57-14.42)	0.204

**Table 6. Knowledge regarding treatment of Glaucoma (among those who said treatment of glaucoma is possible, n=101)**

Treatment of glaucoma	Yes, n(%)	No, n(%)
Medication (eyedrops)	<b>63 (62.4)</b>	38 (37.6)
Laser	<b>47 (46.5)</b>	54 (53.5)
Surgery	<b>88(87.1)</b>	13 (12.9)
<b>Consequences of no treatment of glaucoma</b>		
Blindness	<b>81 (80.2)</b>	
Eye damage	<b>17 (16.8)</b>	
Don't Know	<b>3(3.0)</b>	

Note: the total count for each variable does not matched to total due to presence of missing data  
Correct answers in bold

particularly when they are asymptomatic at the outset. Hospital staff can generally be effective messengers of health to the communities and can also link suspected or high-risk patients to care. They are generally patients’ initial point of contact.<sup>21</sup> Hence, a good understanding of conditions like glaucoma by hospital staff might be an asset in wider dissemination to the communities.

Based on the results of this survey, it is clear that there is still room for improvement for educating on glaucoma to the hospital staff, and doing so might prove to be a significant leap in preventing complications of glaucoma, the “silent thief of sight”

## CONCLUSION

Although there was a fairly good awareness and knowledge of glaucoma among hospital staff, there was lack of understanding on some critical issues on glaucoma, mainly related to its asymptomatic nature. There is thus room for improvement in educating about glaucoma even in healthcare settings. Given the necessity of expanding glaucoma awareness in the public, hospital staff might potentially serve as a messenger to the communities

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In this initial study in Nepal that assessed awareness and knowledge regarding glaucoma among hospital staff, almost one fifth were unaware of glaucoma and among those aware about one seventh had poor understanding of glaucoma. There is a need to organize awareness and training of glaucoma even for the hospital staffs in Nepal.

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