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# Impact of Health Education Programs on Awareness of Glaucoma in a Tertiary Care Hospital in South India

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## Abstract

**Objective:** To assess the impact of health education programs on the awareness and knowledge of glaucoma among subjects attending the Ophthalmology office in a tertiary care hospital in Puducherry.

**Methods:** It is a cross sectional study with 1000 subjects of age >40 years attending the Ophthalmology outpatient department. A questionnaire was administered in English/Tamil to assess the awareness (heard about glaucoma) and knowledge (understanding the disease and risk factors) about glaucoma. Glaucoma awareness programs are being conducted in our hospital and in Puducherry since 2010.

**Results:** The awareness about glaucoma was found to be 41%. Majority of the people who were aware of glaucoma had a good level of knowledge (56.8%).

**Conclusion:** Our study concluded increase in awareness of glaucoma among the people attending the outpatient department post awareness programs. But the awareness was still less than that of cataract and diabetic retinopathy.

**Keywords:** Glaucoma; Awareness; Knowledge; Awareness programs

## Introduction

Glaucoma is the second most common cause of blindness worldwide and has become a major health problem [1]. In India, glaucoma affects approximately 12 million individuals, responsible for 12.8% of blindness and is ranked as the third most common cause of blindness [2,3]. Prevalence of glaucoma in India ranges from 2.6% to 4.1% [4,5]. Blindness due to glaucoma is irreversible and 50% of the glaucoma patients are unaware of their condition [6]. Evidence indicates that delayed diagnosis of glaucoma is because of lack of awareness about the disease [7]. Almost one third of patients have visual impairment even before they seek medical attention [8-10]. Hence glaucoma patients need a constant follow up with the treating physician, which is possible only when the community is aware of glaucoma.

Proper health education and awareness about the disease helps in early detection of the disease. It not only alleviates needless suffering from blindness but also the economic burden on the community [11]. Awareness programs are being conducted in Puducherry from the year 2010, during the world glaucoma week. Thus by estimating the level of awareness and knowledge of glaucoma, the results of organizing such awareness programs are known and further health education programs can be planned. Literature analysis showed that awareness of glaucoma depends on a number of factors such as age, economic status and family history [12,13]. As there is paucity of Indian literature on this topic, the current study has been planned to know the level and determinants of awareness of glaucoma.

## Methodology

Glaucoma awareness programs are being conducted since 2010, in the form of awareness rally and marathon during the glaucoma awareness week. Booklets prepared on glaucoma are being distributed to all patients attending the out-patient department (OPD) and intraocular pressure checked for all patients attending the OPD.

This study was a cross sectional study conducted between January 2012 and December 2015. Institutional ethical clearance was obtained for the study. The study population consisted of subjects selected randomly from the outpatient clinic. Informed consent was taken from all the participants of the study. Subjects less than 40 years of age and unwilling to participate in the study were excluded.

The demographic details of the participants such as age, sex, socioeconomic status, occupation and education status were collected. Coexisting morbidities like diabetes mellitus, hypertension and any other systemic illness were inquired. Patients were administered a questionnaire in Tamil or English to assess their awareness and level of knowledge of glaucoma. "Awareness" of a disease means not knowing the disease in detail but to know something about the disease. People who knew about the disease and risk factors were classified as having "knowledge" about glaucoma.

The questionnaire was administered either by the clinician or the ophthalmic assistants. The same questionnaire was administered to all participants who also included glaucoma patients. Details on the knowledge about glaucoma were obtained only from the patients who were aware of the disease. Subject's responses were recorded in the form of true, false or do not know. The subjects were provided with the

answers and explanation for all the questions at the end of the questionnaire.

Both descriptive and inferential statistics were used to analyze the data. All the categorical data related to socio-demographic factors like age, gender and economic status were presented as frequencies and percentages. Level of knowledge of glaucoma was categorized into poor and good. Univariate chi-square and multivariate logistic regression analysis were used to identify the factors associated with the level of knowledge. All statistical analyses were carried out for two tailed significance at 5% level of significance and p value<0.05 was considered significant. Data analysis was performed using SPSS (version 20.0, SPSS Inc.).

## Results

The age group of the subjects recruited in our study ranges from 40-88 years. The awareness about glaucoma among people who attended the ophthalmology OPD was 41%. Awareness was more in the younger age group [adjusted odds ratio (OR-1.3; 95% confidence interval (CI)=0.87-1.95). There was almost equal gender distribution. Males were more aware of glaucoma (OR-1.7; 95% CI=1.17-2.52) than females. There were more subjects in the earning group and they were more aware of glaucoma (OR-2.9; CI=1.96-4.31) compared to subjects from the non-earning group. Subjects from Puducherry were more aware of glaucoma compared to subjects from other places (OR-3.03; 95% CI=1.97-4.69). Rest of the results is tabulated in Tables 1-3.

| **Age Range (years)** | **40-88** |
|---|---|
| 40-59 | 643 |
| >=60 | 357 |
| Male: Female | 509:491 |
| Economic status-Earning: Not earning | 412:588 |
| Locality-Puducherry: others | 335:75 50.3%, 22.5% |
| Subjects with family history of glaucoma | 77 |
| Subjects with knowledge about DR | 468 |
| Subjects with knowledge about cataract | 596 |
| Subjects working in health sector | 172 |
| Glaucoma patients | 121 |
| Awareness about glaucoma | 410 |
| Knowledge about glaucoma-poor (1-4) | 177 |
| Good (5-10) | 233 56.8% |

**Table 1:** Frequency distribution

| **Sl.no** | **Variable** | **Awareness about glaucoma** | | |
|---|---|---|---|---|
| | | **Aware** | **Odds ratio (CI)** | |
| | | | Unadjusted | Adjusted |
| 1 Age (yr) | | | | |
| | 40-59 | 263 (40.90) | 0.99 (0.760-1.286) | 1.306 (0.875-1.950) |
| | >=60 | 147 (41.2) | | |
| 2 Gender | | | | |
| | Male | 234 (46) | 1.523 (1.182-1.963) | 1.723 (1.174-2.528) |
| | Female | 176 (35.8) | | |
| 3 Economic status | | | | |
| | Earning | 242 (58.7) | 3.559 (2.729-4.641) | 2.912 (1.967-4.311) |
| | Not earning | 168 (28.6) | | |
| 4 Geographic distribution | | | | |
| | Puducherry | 335 (50.3) | 3.495 (2.593-4.711) | 3.039 (1.970-4.690) |
| | Other | 75 (22.5) | | |
| 5 Knowledge about cataract | | | | |
| | Yes | 316 (53) | 3.722 (2.809-4.931) | 2.1 (1.365-3.228) |
| | No | 94 (23.3) | | |
| 6 Knowledge about Diabetic retinopathy | | | | |
| | Yes | 323 (69) | 11.394 (8.424-15.410) | 5.681 (3.802-8.489) |
| | No | 87 (16.4) | | |
| 7 Subjects with family history of glaucoma | | | | |
| | Yes | 75 (97.4) | 65.821 (16.059–69.776) | 22.355 (5.008-99.797) |
| | No | 335 (36.3) | | |
| 8 Subjects working in health sector | | | | |
| | Yes | 158 (91.9) | 25.796 (14.643-45.442) | 7.103 (3.761-13.414) |
| | No | 252 (30.4) | | |
| 9 Glaucoma patients | | | | |
| | Yes | 110 (90.9) | 19.3 (10.225-36.430) | 20.253 (9.546-42.968) |
| | No | 300 (34.1) | | |

**Table 2:** Awareness about glaucoma (CI–confidence interval, The values in () indicate percentages, Unadjusted odds ratio was calculated using chi-square test, Adjusted odds ratio was calculated using multivariate logistic regression analysis)

| Sl.no | Variable | Knowledge about glaucoma | | | |
|---|---|---|---|---|---|
| | | 5-10 | <=4 | Odd s ratio (CI) | |
| | | | | Unadjusted | Adjusted |
| 1. | Age (yrs)<br>40-59 | 154 (58.6) | 109 | 0.822 (0.548-1.235) | 1.317 (0.835-2.077) |
| | >=60 | 79 (53.7) | 68 | | |
| 2. | Gender<br>Male | 126 (53.8) | 108 | 1.329 (0.894-1.977) | 0.905 (0.586-1.396) |
| | Female | 107<br>(60.8) | 69 | | |
| 3. | Economic status<br>Earning | 135 (55.8) | 107 | 1.110 (0.745-1.652) | 0.852 (0.549-1.323) |
| | Not earning | 98 (58.3) | 70 | | |
| 4. | Geographic distribution<br>Puducherry | 198 (59.1) | 137 | 0.605 (0.366-1.001) | 1.189 (0.665-2.126) |
| | Other | 35 (46.7) | 40 | | |
| 5. | Knowledge about cataract<br>Yes | 191 (60.4) | 125 | 0.529 (0.332-0.841) | 1.376 (0.785-2.412) |
| | No | 42 (44.7) | 52 | | |
| 6. | Knowledge about Diabetic retinopathy<br>Yes | 200 (61.9) | 123 | 0.376 (0.231-0.612) | 1.991 (1.117-3.549) |
| | No | 33 (37.9) | 54 | | |
| 7. | Subjects with family history of glaucoma<br>Yes | 55 (73.3) | 20 | 0.412 (0.237-0.718) | 2.067 (1.137-3.757) |
| | No | 178 (53.1) | 157 | | |
| 8. | Subjects working in health sector<br>Yes | 117 (74.1) | 41 | 0.299 (0.194-0.461) | 2.924 (1.808-4.728) |
| | No | 116 (46) | 136 | | |
| 9. | Glaucoma patients<br>Yes | 71 (64.5) | 39 | 0.645 (0.410-1.013) | 1.982 (1.178-3.336) |
| | No | 162 (54) | 138 | | |

**Table 3:** Knowledge about glaucoma (CI-confidence interval. The values in () indicate percentages, Unadjusted odds ratio was calculated using chi-square test, Adjusted odds ratio was calculated using multivariate logistic regression analysis)

## Discussion

Glaucoma awareness in a developing country like India is very less compared to that of a developed country. It is well known that early diagnosis and prompt treatment can delay the progression of glaucoma. Blindness due to glaucoma can be alleviated to a limited extent by educating the people about the condition and thereby ensuring the individuals at risk to seek ophthalmic care and intervention [11]. Various governmental and non-governmental organizations are taking measures to impart health education about various ocular diseases, thereby make people aware of such diseases. To the best of our knowledge, only three studies in India have analyzed the degree of awareness of glaucoma [14-16]. Studies have shown that the age and sex adjusted glaucoma awareness rate among general urban population was only 13.5% [16] and awareness of glaucoma was very limited in the rural areas of southern India [17].

The awareness about glaucoma in our study was 41%. This percentage of awareness of glaucoma in our study is more compared to the studies done by Rakhi Dandona et al. [14] (2.3%) and Sannapaneni krishnaiah et al. [15] (0.32%) in urban and rural population of southern India. It is also more when compared to the study done by

Ramesh Ve Sathyamangalam et al. [16](13.5%) in the Chennai glaucoma study and considerably less when compared to the studies done by Gasch et al. [13] and S-M Saw et al. [7] in Singapore Chinese patients.

Out of the total 59.6% of subjects who were aware about cataract, only 53% of them were aware of glaucoma (OR-2.1; 95% CI=1.36-3.22). Out of the total 46.8% of subjects who were aware about diabetic retinopathy, only 69% of them were aware of glaucoma (OR-5.6; CI=3.8-8.48). Among subjects who had a family history of glaucoma, 2.6% of them were not aware of glaucoma. In our study, 9.1% of the glaucoma patients themselves were not aware of the disease they have. In addition to this, 8.2% of the subjects working in medical field were also not aware of glaucoma.

Most of the subjects who were aware of glaucoma had good knowledge about glaucoma (56.8%). Subjects who were aware of diabetic retinopathy (OR-1.9; CI=1.11-3.54), subjects with family history of glaucoma (OR-2; CI=1.13-3.75) and glaucoma patients themselves (OR-1.9; CI=1.17- 3.33) were around 2 times more likely to have good knowledge about glaucoma. Subjects working in health sector were three times more likely to have good knowledge about glaucoma (OR-2.9; CI=1.8-4.72).

The reason for increased awareness of glaucoma among people attending the Ophthalmology office can be attributed to a number of glaucoma awareness programs conducted every year in the hospital and in Puducherry. They include organizing rallies and screening all subjects for glaucoma during the world glaucoma week. This clearly signifies the role of conducting public awareness programs in improving the awareness of glaucoma. The need for more awareness programs to further increase the awareness of glaucoma stands unimpeded.

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