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Original Research Article

An interventional study on awareness, knowledge and services provided for the diagnosis and treatment of glaucoma by optometrists in primary healthcare centre of Kolar district

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ABSTRACT

Purpose: Aim of this study was to assess the awareness, knowledge services provided for glaucoma among optometrists at primary health care.
Materials and Methods: A cross-sectional questionnaire based study involving 36 Optometrists from Primary Healthcare Centre and government hospitals of Kolar and Chikkaballapur district, who participated in the 'World Glaucoma awareness program'. The responses were compiled and analyzed for each category of questions using paired t test.
Results: Out of 36 participants 31 (86.11%) were males and 5 (13.89%) were females with an average age of 39.42+10.5 years and average duration of service in PHC/CHC/Taluk Hospital was 14.08 years. Among them 88.9% were aware about glaucoma being a disease due to increased intra ocular pressure (IOP). Although 69.4% knew that it leads to irreversible blindness, 75% were unaware of the symptoms that glaucoma presents with. 53% were unaware of the normal IOP of the eye and 41.7% the test to detect the same. 33.3% of hospitals had Shiotz tonometer but only 22.2% were aware of testing the IOP and peripheral visual field for diagnosing glaucoma. 61.1% were not familiar with any antiglaucoma drug and 52.8% about the duration of treatment. Post-test analysis was statistically significant with respect to the Awareness, Knowledge and Services (P=0.001, P=0.001, P=0.001).
Conclusion: This study reveals the lacunae and highlights the importance of routine eye examination of rural population by Optometrists for early detection of glaucoma through improved services and timely referral to Ophthalmologists for further evaluation, thereby reducing the burden of visual impairment.

1. Introduction

After cataract glaucoma is the second leading cause of blindness globally with an estimated prevalence of 67 million people worldwide.[1] In India, it is the third most common cause of blindness and approximately 12 million people aged > 40 years are affected with glaucoma.[2] By 2050 the irreversible blindness due to glaucoma is expected to double to 6 million.[3] Most of the cases remain undiagnosed (>90%), because most of the population live in rural areas with poor access to health care.[4,5]

Glaucoma is an irreversible and asymptomatic condition that is diagnosed in the advanced stage. In most cases of blindness from glaucoma can be prevented if early detection of the disease and proper treatment is implemented. But one third of the people who had glaucoma sought medical attention only after they were blind from the disease.[6,7]

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So primary screening is an essential tool to reduce the burden of the disease. In country like India where rural population is predominant and also awareness about glaucoma is poor among them, the screening at the early stage plays an important role.[8] In rural areas there is scarcity of ophthalmologist, so the primary eye care providers are often Optometrists and Ophthalmic technicians available in primary health care.

In western countries like UK optometrist will not only provide traditional clinical roles of refraction, but they also provide extended role services, mainly for glaucoma like doing visual fields, fundus study and also follow up of the patients.[9] In India optometrist play an important role in successful implementation of Vision 2020 and NPCB which aims to reduce visual morbidity caused by Glaucoma. They disseminate information about diseases on interaction with people at the grass root level. In this study we intend to find out the knowledge of glaucoma among optometrists and also the services provided by them at primary health care centres.

2. Materials and Methods

This was a descriptive, cross-sectional, questionnaire based study involving 36 Optometrists and Ophthalmic technicians working in primary health care centers' of Kolar and Chikkaballapur district who participated in the awareness program in view of "World Glaucoma Week– The world is bright, save your sight". The questionnaire were given in English and Kannada language which consisted of the questions regarding awareness, knowledge and services provided for the diagnosis and management of glaucoma by them at their respective setup. All enlisted participants were informed about the purpose of the study and written consent was obtained, after approval from the Institutional Ethics committee (No.SDUMC/KLR/IEC/123/ 2022-23). The information about participant's characteristics i.e. age, gender, education level, place and duration of occupation was documented.

The multiple choice options based questionnaire had three parts: Part A consisted of 7 questions to assess the awareness of glaucoma. Part B contained the 9 questions about their knowledge about glaucoma and part C had 7 questions dealing with the services provided by them for the diagnosis and management of glaucoma.

All the participants were sensitized about glaucoma screening through power point presentation followed by small group hands on training of glaucoma evaluation like assessment of anterior chamber depth by torch light and slit lamp, measurement of intraocular pressure by Digital, Schiotz and Applanation Tonometry, Humphrey's Visual Field Analysis, Gonioscopy, corneal thickness by Ultrasound pachymetry and Optical coherence tomography by the department faculty. By doing, so we re-emphasised the importance of early referral of all glaucoma suspect cases to higher centres for the early diagnosis and initiation of appropriate treatment to prevent ocular morbidity that eventually aids in decreasing the burden of global blindness.

The data was entered into MS Excel 2007 version and further analyzed using SPSS 22. Before subjecting the data to statistical analysis, the normality of the data was checked through Shapiro-Wilk test. The pretest data on awareness, knowledge and services offered were found to follow the assumptions of normality. After confirming normality, for the descriptive analysis, the categorical variables were analyzed by using percentages and the continuous variables were analyzed by calculating mean ± Standard Deviation. For inferential analysis, the pre and post mean values on awareness, knowledge and services offered was analyzed using paired t test. Effect size calculations were done using Cohen's D online. P value <0.05 was considered as statistically significant.

3. Results

Out of the 36 participants enlisted, 31 (86.11%) were males and 5 (13.89%) were females. The average age of the participants was 39.42±10.5 years and average duration of service in PHC/CHC/Taluk Hospital was 14.08 years.

Among the 36 participants 88.9% were aware about glaucoma being a disease due to increased IOP. 75% of the participants were unaware of the symptoms of glaucoma. 30.6% of them knew that it leads to irreversible blindness. 53% were unaware of the normal intra ocular pressure of the eye and 41.7% were unaware of test to detect IOP. Shiotz tonometer was available in 33.3% of the setup and only 22.2% were aware of testing the IOP and peripheral visual field for diagnosing glaucoma.

After sensitization of all the participants, the post-test analysis showed a statistically significant increase in Awareness, Knowledge and Services provided (P=.001, P=.001, P=.001).

Mean pre and post test scores on awareness, knowledge and service provided for the selected sample.

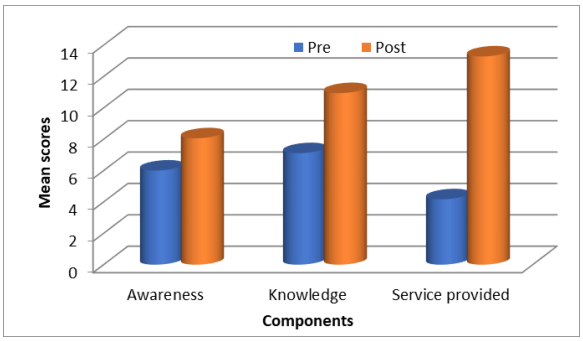

Figure 1: Effect size calculations

The Cohen's d, values obtained for components-Awareness, Knowledge and Services provided were found to be medium to large, large and large respectively.

Table 1: Characteristics of the optometrists

Characteristics		N	%
Gender	Male	31	86.11
	Female	5	13.89
Qualification	BSc optometry	17	47.22
	Diploma in ophthalmic technology	19	52.78
Work place	Primary healthcare Centre	28	77.8
	Community Health Centre	1	2.8
	Taluk hospital	7	19.4

Table 2: Awareness of glaucoma

S. No.	Awareness	Yes		No	
		N	%	N	%
1	Have you ever heard of Glaucoma?	36	100	0	0
2	What is Glaucoma?	32	88.9	4	11.1
3	Most common symptom of glaucoma	9	25	27	75
4	What is glaucoma is associated with?	5	13.9	31	86.1
5	Is Glaucoma treatable?	30	83.3	6	14.7
6	Is Glaucoma preventable?	25	69.4	11	30.6
7	Can glaucoma cause complete blindness?	24	66.7	12	33.3

Table 3: Knowledge about glaucoma and its risk factors

S. No.	Knowledge		Yes		No	
			N	%	N	%
1	Glaucoma is characterized by end damage to		3	8.3	33	91.7
2	Is glaucoma associated with redness of the eyes ?		28	77.8	8	22.2
3	Does glaucoma run in family ?		17	47.2	19	52.8
4	Risk factor for glaucoma ?	Hypertension	8	22.2	28	77.8
		Diabetes	8	22.2	28	77.8
		Smoking	6	16.7	30	83.3
		Alcohol	6	16.7	30	83.3
		Steroids	11	30.6	25	69.4
		Obesity	12	33.3	24	66.7
5	Is visual loss due to glaucoma reversible?		7	19.4	29	80.6
6	What is the Normal range of IOP?		13	36	23	64
7	Raised IOP without optic neuropathy is glaucoma		5	13.9	31	86.1
8	Can Glaucoma be associated with normal IOP?		11	30.6	25	69.4
9	What are the treatment options available for glaucoma?		13	36	23	64

Table 4: Services provided to diagnose and treat glaucoma

S. No.	Services Provided	Yes		No	
		N	%	N	%
1	To diagnose Glaucoma?	30	83.3	6	14.7
2	Is measuring IOP an investigation for glaucoma?	34	94.4	2	5.6
3	What instrument is used to check optic nerve changes?	22	61	14	39
4	Is ophthalmoscope available in your PHC?	29	80.6	7	19.4
5	What is the test to detect visual field loss?	17	47.2	19	52.8
6	Do you know how to operate visual field analyser?	21	58.3	15	41.7
7	What is duration of treatment of Glaucoma?	14	38.9	22	61.1

Table 5: Mean pre and post test scores on awareness, knowledge and service provided for the selected sample and results of paired samples t tests

Components	Session	Mean	S.D	Mean difference	't' value	P value
Awareness	Pre	6.00	1.373	2.056	6.452	.001
	Post	8.06	1.548			
Knowledge	Pre	7.11	1.769	3.833	2.741	.001
	Post	10.94	2.540			
Service provided	Pre	4.17	2.091	9.111	20.391	.001
	Post	13.28	1.523			

Note: df=35

Table 6: Cohen's d, effect size r and respective interpretations for components- Awareness, Knowledge and Services provided

Components	Cohen's d	Effect size r	Interpretation
Awareness	1.407	0.576	Medium to large
Knowledge	1.750	0.658	Large
Services offered	4.980	0.928	Large

This indicates that the sensitization programme employed in the present study was highly effective in improving the Awareness, Knowledge and Services provided of 36 Optometrists and Ophthalmic technicians.

4. Discussion

The silent thief of vision glaucoma, does not give any warning signs until it is advanced and hence eliminating the irreversible blindness is a major challenge. As the ocular morbidity is progressive in nature, the early detection and initiation of prompt treatment can delay its progressive damage. Therefore, the World Glaucoma Week aims at enlightening all the eyecare providers and community about regular simple eye checks which allow earlier detection that can save the sight. Regular programs to create public awareness is needed to see the change.

This study assesses the awareness, knowledge of glaucoma and services provided by the optometrists for management of glaucoma at the Primary Healthcare Centre and Government Hospitals in Kolar and Chikkaballapur districts of Southern Karnataka. The main intent of this survey was to educate the optometrists to know about glaucoma and who will encourage the general public to undergo glaucoma screening. Therefore, the World Glaucoma Week is a great opportunity to raise awareness through prompt publicity.

This study included 31 (86.11%) male and 5 (13.89%) female optometrists with an average age of 39.42+10.5 years. Among them 19 (52.78%) had Diploma in ophthalmic technology and 17 (47.22%) BSc Optometry degree; but 28 (77.8%) were practising in Primary healthcare centre. (Table 1)

Although majority were aware about the term glaucoma and that it is a treatable and preventable blindness, 27 (75%) were unable to recognize its symptoms and 31 (86.1%) were not aware of its association with optic nerve damage. Similar studies in North India and Africa, showed that almost all the health personnel were aware of the condition.[10,11] (Table 2)

In a study on 154 involving 42 clinicians, 48 non-clinical doctors, and 52 paramedical staff the knowledge about association of glaucoma with raised intraocular pressure (81%) was better than optic nerve damage (64%).[12] In a similar study by Nageeb and Kulkarni in South India, about 8% health professionals had not heard of the term, all of them being paramedical staff.[13]

There was a major lacunae in the knowledge regarding the understanding of the disease. Half of the participants knew that it is hereditary but majority of them were unaware of the risk factors associated with glaucoma (66.7 - 77.1%), visual loss due to glaucoma is irreversible (80.6%), normal range of IOP (64%), glaucoma can occur with normal IOP (69.4%) and various treatment options available for glaucoma (64%). Though awareness of glaucoma was high, knowledge about glaucoma was low among the participants similar to other studies.[14,15] Correct knowledge of glaucoma was observed in optometrists with BSc Optometry degree (47.2%) than those with Diploma in Ophthalmic technology (52.8%). (Table 3)

Usually the glaucoma cases goes undetected due to lack of "comprehensive eye examination" performed by the Optometrists at a PHC level.[16] Optometrists play an essential role as service providers by screening, suspecting, diagnosing and follow-up of glaucoma such as assessment of anterior segment, measurement of intraocular pressure, recognizing the non-compliance in treatment and timely referral for visual rehabilitation.

Although they were aware of the importance of measurement of intraocular pressure using shiotz tonometer, 40% of the participants were unaware of the role of visual field analyzer and to operate the same. Twenty nine (80.6%) had the facility of Direct Ophthalmoscope but they were underconfident in the performance as well

as interpretation of optic disc changes in the diagnosis of glaucoma. Besides screening and timely referral, they also can play an essential role in the visual rehabilitation of glaucoma patients following its management either medically or surgically. Unfortunately, 22 participants were not aware of the duration of treatment in the management of glaucoma. (Table 4)

All the participants sensitized about glaucoma screening through power point presentation and hands on training about glaucoma evaluation was subjected to post test which showed a statistically significant mean difference between the pre-test and post-test with respect to the Awareness, Knowledge and Services (P=0.001, P=0.001, P=0.001).(Table 5)

So, strengthening the practice pattern of Optometrists in the country, will lower the prevalence of visual impairment and the burden of blindness.[17] Further, Bachelor's and Master's course curriculum for the training of optometrists should emphasize more practical learning including, slit-lamp examination for anterior chamber depth assessment using the Von Herick grading evaluation, identification of angle-closure using gonioscopy, checking for patency of peripheral iridotomy, performing applanation tonometry, performing 90-D slit-lamp biomicroscopy, along with pediatric eye examination, non-contact tonometry, and direct and indirect ophthalmoscopy.[18]

Finally, since this is a pilot study major limitation being study done on optometrist and ophthalmic technicians in single district with sample size being relatively small. Further population based multicenter study involving large number of subjects will be more conclusive and would make it a good community based study which will help early detection of glaucoma.

5. Conclusion

Optometrists are the first line of contact for patients in general, and strengthening their activities is mandatory to improve the public eye health system. The observations in this study indicate that the knowledge of Glaucoma, its symptoms, investigations and possible treatment needs to be enhanced among optometrists working in PHC from time to time by conducting regular seminars and hands on training or workshops.

6. Source of Funding

None.

7. Conflict of Interest

None.

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