Perceived barriers to low vision rehabilitation services among eye care practitioners in Ethiopia: a cross-sectional study

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Abstract

Background: Low vision rehabilitation services are one of the least covered subjects in ophthalmic literatures. In contrary to this, 2.2 billion people have visual impairment or blindness worldwide. Among these, 1 billion people have a vision impairment that could have been prevented or could be addressed.

Objective of the study is to determine the barriers of low vision rehabilitation services in Ethiopia.

Methodology: A cross sectional descriptive survey was conducted over practicing ophthalmic personnel in Ethiopia during a 2 months period (June 1 to July 30, 2020). The data was entered to Epi data manager version 4.4.1.0 and exported to SPSS version 23 for different analyses. Descriptive statistics like means, proportions and frequency tables was applied for different analysis. Chi-square test was used to test association between independent variable and dependent variables.

Result: A total of 150(72.8%) out of 206 responded to the questionnaire and completed it in appropriate way. Out of 150 participants 115(76.7%) were males. Mean and standard deviation of age was 30.62±3.89 years. Among study participant's 54(36.0%) were Ophthalmologists and subspecialists, 6(4.0%) Cataract-Surgeon, 49(32.7%) Ophthalmology-Residents and 27(18%) Optometry-Professionals. The major barriers that ophthalmic personnel face in providing low visions care includes: non-availability and expensiveness of low vision devices136 (90.67%), lack of training 117(78%), lack of awareness 49 (32.7%), lack of interest/motivation 38(25.3%) and more work load and lack of man power 34(22.67%). The perception that lack of interest/motivation is a major barrier in providing low vision rehabilitation is significantly higher [OR 3.148(1.459, 6.795)] among those who were knowledgeable than not knowledgeable about low vision services and among those trained in Ethiopia [OR 5.062(1.345, 19.050)] than abroad. Lack of training was perceived to be a major constraint for the provision of low vision rehabilitation in a greater proportion of respondents who were from institution giving low vision rehabilitation [OR 4.0125 (1.471, 10.945)] than who didn't provide low vision rehabilitation services.

Conclusion and recommendation - Non-availability of low-vision devices and expensiveness of low vision device within the country is the most common constraint for the provision of low vision rehabilitation. Majority of the participants have good awareness about low vision rehabilitation service but less knowledgeable. Training in low-vision care should be provided for eye care personnel at all levels. It is better if Ethiopian Ministry of Health give concern for ways to provide low vision devices at all government eye care services.

Background

Visual impairment is classified in to two as distance and near vision impairment by international classification of diseases 11(2018). Distance vision impairment is further divided into four as mild vision impairment with presenting visual acuity (VA) of <6/12 on the better eye, moderate vision impairment (VA <6/18), severe (VA<6/60) and blindness (VA<3/60). The near visual impairment is defined as presenting near VA (NVA) worse than N6 or M.08 with existing correction. Vision impairment experience of peoples

differs due to different factors. Those factors include: availability of prevention and treatment facilities, access to vision rehabilitation center (including assistive products like glasses, white cane, etc.) and if the person experiences problems with inaccessible buildings, transport or information(1).

About 2.2 billion people have visual impairment (VI) or blindness worldwide. It is observed that about 90% of the so-called blind population do not have a total loss of visual function, they retain some degree of useable residual vision(2). Among these, 1 billion people have a vision impairment that could have been prevented or could be addressed. Nine out of 10 of the world's blind live in a developing country, especially Asia & Africa(3). The causes for preventable or treatable VI include: refractive error (123.7 million), cataract (65.2million), glaucoma (6.9 million), corneal opacities (4.2 million), diabetic retinopathy (3million) and trachoma (2million). The treatable near VI (NVI) is commonly caused by unaddressed presbyopia (826 million)(4). In developing country prevalence of distance vision impairment is four times higher than developed regions. Unaddressed near VI are >80% in Africa but lower than 10% in developed regions(5).

The national prevalence of blindness and low vision are 1.6% and 3.7% respectively with considerable regional variations in Ethiopia(6). In another institution based study in St. Paul hospital done by Cherinet et al, in 2019, the prevalence of low vision and blindness is 10.3% and 7.3% respectively(7).

Vision rehabilitation should be part of the continuum of ophthalmic care including medical, surgical management and refractive correction. It may begin starting from birth and continues throughout life time. The goal of low vision rehabilitation should be to maximize the visual function of individual. In doing this, the individual becomes independent and the quality of life is improved because there is enhanced visual function(8). Low vision rehabilitation requires usually multidisciplinary team. This team include: medical, optometric, allied health (occupational therapist/ physical therapist), social, educational/rehabilitative, mobility and psychological services(9).

Patients should be referred for low vision rehabilitation if they have trouble reading, watching television, recognizing person, signing name, paying bill, walking stair, curbs, crossing street or driving. Patients with these problems despite maximal treatment should get additional vision care/vision rehabilitation services and/or counseling, education and/or problem solving therapy services(10).

Low vision can dramatically pose the social, psychological and economic problems on the individual patient, the community and the country at large. Low vision and blindness from ARMC, cataract, diabetic retinopathy (DR), glaucoma and under-corrected RE affect 1.58- 2.31 million people in the UK. Direct health care cost is £3.0 billion, with impatient and day care cost being £735 million and outpatient comprising £771 million. Indirect costs estimated to be £5.65 (5.12 - 6.22) billion(11, 12).

Patients having vision loss was found to have 4.6 times higher risk of suffering from psychological distress compared to patients with normal vision. It was found in 49.8% of patients who had loss of vision at least in one eye but only in18.3% of the controls had it. Patients with vision loss in both eyes

and worse VA in the better eye are more likely to have psychological distress than patients with vision loss in one eye only and good VA in the better eye respectively (13).

Even if there are many studies done about vision rehabilitation services across the world, there is no such study done in Ethiopia yet amid continuous increment in visual impairment and blindness worldwide and of course in SSA and Ethiopia(14). Despite the efforts of some globally recognized individuals and institutions, coverage of low-vision rehabilitation service and the patient flow where the service is available have remained low even in developed regions(15).The aim of this study is to explore the barriers of visual rehabilitation services among the ophthalmic personnel in all centers in Ethiopia.

Methods

Study design, population and setting

The study was conducted from June 1 to July 30, 2020 at all governmental and non-governmental ophthalmic centers in Ethiopia. Ethiopia is one of the rapidly developing countries in sub-Saharan Africa. It is located in tropical climatic condition. It is the 2nd most populous (114.9 million) nation after Nigeria (206 million) in Africa. A cross sectional descriptive survey was conducted over practicing ophthalmic personnel in all ophthalmic centers in Ethiopia who were accessible.

Data collection

Data was taken from practicing ophthalmologists, cataract surgeons, Ophthalmology residents, optometrists and ophthalmic nurses accessing by email. Initially the professionals included were identified. Then the web-based online survey format was sent for all professionals fulfilling the inclusion criteria through email. All data were seen and filled on the semi-standard questionnaire(Annex II) by the volunteer professionals working at all centers. A reminder mail was sent and phone called after 4, 5 and 6 weeks for those who didn't respond to the first mail. The data recorded by all volunteered professionals include: socio-demographic data, place of work, involvement in low vision practice, awareness about low vision rehabilitation, training in low vision care, awareness and involvement in vision 2020 activities, WHO criteria for diagnosis of low vision patients, availability of LVDs at their center and their opinion about inclusion of low vision care in the training program. Data collection terminated when the calculated sample size was reached (152).All the responses were collected into the Gmail drive and accessible to the investigators at any point of time.

Operational definitions and definition of terms.

- **Ophthalmic personnel**: the professionals working either as ophthalmologists (general, sub-specialty), Ophthalmology residents, Optometrists (BSc, MSc) or Ophthalmic nurses (Diploma, BSc).

- **Low vision patient**: one who has impairment of visual functioning even after treatment and/or standard refractive correction and has a visual acuity of less than 6/18 to LP or a visual field of < 10^{o} from the point of fixation but uses or potentially able to use the vision for the planning and/or execution of tasks.
- **Low-vision devices**: Appliances, aids or methods/techniques (optical and non-optical) which help low-vision patients to maximize visual potential or for maximal use of the residual vision.
- **Low vision rehabilitation service**: a care given for patients with low vision by the use of low vision devices, training the effective use of the residual vision and advice about the environment and orientation/mobility skills to enhance and promote the patient's social, vocational and educational activities.

Validating methods

- **Knowledgeable**: proper answer for at least 3 of the following 5 parameters(16).

1. You consider a person as having low vision based on: WHO criteria
2. As to you the criteria for low vision includes: Visual acuity OR visual field
3. You consider a person is having low vision by VA if < 6/18
4. You consider a person is having low vision by visual field if < 10 degree
5. What is low vision rehabilitation? >/=3 options

- **Awareness**: The personnel are aware if responded correctly for 5 or more of the following 8 parameters(17).

1. Have you heard about low vision? yes
2. Do you know about the availability of low vision devices? yes
3. Are you aware of WHO definition of low vision of low vision? Yes
4. Do you know any organization providing low vision rehabilitation? Yes
5. Are you aware of vision 2020? Yes
6. Low vision has not been identified as priority in vision 2020. no
7. Are you involved in vision 2020? Yes
8. Are you aware of concessions for low vision patients? Yes

Data processing and statistical analysis

Data was entered using epidata version 4.4.1.0 and exported to SPSS version 23.0 to perform statistical tests. Descriptive statistics like means, proportions and frequency tables were applied for the analysis of

relevant socio-demographic characteristic. The categorical variables were analyzed by using the Chi-square test to test association with the dependent variables.

Results

A total of 152 out of 206 practitioners agreed to respond making a response rate of 72.8%. Two participants didn't complete the questionnaire well and therefore not included in the analysis.115(76.7%) of the participants were males. The age of participants ranges from 23 to 45 years. The mean age of the respondents was 30.62 years. 32.7% of the respondents comprised residents on training while 36.0% were ophthalmologists and subspecialists, 18% optometrists, and 7.3% ophthalmic nurses, 4.0% cataract surgeons and 2% opticians. Among the seniors (Ophthalmologists), 41(87.23%) had largely undergone their residency training within Ethiopia while 6(12.76%) had their training overseas. See table 1 for the detail.

Among all 150 respondents, 88% were working at a teaching/specialized government hospitals while the remaining 12 %were largely working in non-teaching hospitals, i.e. private centers and NGOs. Regarding their level of experience in ophthalmology, 112(74.7%) respondents had less than five years of experience. The other 38(25.4%) respondents had more than or equal to 5 years of experience. Total of 94.7% of the participants noted that their primary site of activity to be on patient's eye examination with or without training eye care personnel, low vision rehabilitation and community eye health, 72 (48%) eye care personnel work primarily at training eye care personnel and 19 (12.7%) of them practice on low vision rehabilitation. See table 1 below.

Table 1

Socio-demographic data of respondents

Independent variables	Category	Number(N)	Percent (%)
Age	(Mean±SD)	30.62±3.89	
	(Minimum,Maximum)	(23,45)	
	≤30 Years	97	64.7
	>30 Years	53	35.3
Sex	Female	35	23.3
	Male	115	76.7
Qualifications	Seniors[1]	54	36.0
	Ophthalmology residents	49	32.7
	Others [2]	47	31.3
Experience	≤5 Years	112	74.7
	>5 Years	38	25.3
Organization where practicing	Governmental	132	88.0
	Non-governmental	18	12.0
Over all knowledge status about low vision(Score of ≥3 out of 5 score	Knowledgeable	104	69.3
	Not knowledgeable	46	30.7
Over all awareness	Aware	134	89.3
Status low vision(score of ≥5 out of 8)	Not aware	16	10.7
Place of training	Ethiopia	140	93.3
	Foreign	10	6.7
Primary area of activity	Patient's eye examination (Yes)	142	94.7
	Training eye care personnel(Yes)	72	48.0
	Community eye health/prevention of blindness(Yes)	52	34.7
	Low vision rehabilitation services((Yes)	19	12.7
	Others	5	3.3

[1]= Ophthalmologists 49 and 5 Ophthalmology sub-specialists

[2] = Others (20 BSc in Optometry, 7 MSc in Optometry, 6 cataract surgeons, 3 opticians, 11 Ophthalmic-Nurses)

Table 2

Awareness response

Awareness	Number	Percent
Well aware	134	89.3
Low awareness	16	10.7
Total	150	100.0

All of the respondents (100%) had heard about low vision service. 135 (90%) respondents knew about the existence of low-vision devices. Regarding the level of involvement in low vision practice, only 19(12.7%) of them were involved in varying levels/scopes of low-vision practice.

97.3% of them were aware of vision 2020 the right to sight. 127(84.7%) knew that low vision has been identified as a priority in vision 2020 program. Regarding their level of involvement in Vision 2020 activities, ninety four (62.7%) participants had been involved in vision 2020 activities. Majority of the respondents (98.7%) were aware of WHO definition of low vision. Generally 89.3% of the participants have good awareness (Table 2 above).

Regarding the diagnosis of low vision, 90.7% of the respondents mentioned the WHO criteria to consider a person as having low vision. Others mentioned patient needs (unable to perform daily activities/hobbies) and poor vision in both eyes to consider a person as having low vision representing 8% and 0.7% respectively. 0.7% of the respondents didn't know/not sure about the criteria for the diagnosis.

Ninety nine (66%) of the respondents defined low vision rehabilitation as training to use low vision devices, mobility training and adaptive training for job, while 14.7% replied training to use low vision devices, 6.7% responded as training to use low vision devices, 6% replied as training to use low vision devices and adaptive training and 2% responded adaptive training & mobility training as a definition of low vision rehabilitation services.

Ninety one (60.7%) of the practitioners considered a person is having low vision when the VA in the better eye is less than 6/18, 22% when the VA is less than 6/60, 16% if the VA is less than 3/60 and 1.3% when the VA is less than 1/60. In terms of VF, eighty (53.3%) of the participants considered a person is having low vision when the VF from the point of fixation is less than 10^{o}, 21.3% when the VF is less than 20^{o}, 10% when the VF is less than 30^{o}. Twenty three (15.3%) respondents were not sure. From all participants 69.3% of them are knowledgeable about low vision (Table 3).

Table 3 Status of health care giver knowledge			
	Frequency	Percent	Cumulative Percent
Well knowledgeable	104	69.3	69.3
Less knowledgeable	46	30.7	100.0
Total	150	100.0	

From all participants, 87.4% mentioned retinal problems, post cataract extraction, glaucoma and RE as a cause of low vision while retinal problems, post cataract extraction, glaucoma and RE account for 7.3%, 4%, 3.3% and 5.3% respectively (See figure1).

53.8% of the practitioners provide best possible spectacle correction with or without providing low vision devices or other low vision visual rehabilitation services. Two percent of the respondents provide low vision devices while 2.7% provide complete low vision rehabilitation services. Four percent of the participants refer the patients with low vision to other specialized hospitals. See figure 2 below for more.

Responses related to the perceived barriers to the provision of low-vision service for the ophthalmic personnel are illustrated in (Table 4). Non-availability of low-vision devices and expensiveness of low vision device within the country (n =136; 90.67%),lack of training in low-vision practice (n =117; 78%),lack of awareness (n= 49, 32.7%) were noted to be the main barriers among the 150 practitioners.

Table 4

Major barriers faced in providing low vision care (of the ophthalmic personnel)

Variables for barrier	Number(N)	Percent(%)
Non-availability and expensiveness of low vision device	136	90.67
Lack of training	117	78.0
Lack of awareness	49	32.7
Lack of interest/motivation	38	25.3
More work load and lack of man power	34	22.67
Less profitability and time consumption of low vision care	28	18.67
Difficulty in satisfying patients and non-effectiveness of low vision care	18	12

Regarding the perceived barriers for the patients to access low-vision service, 142 (94.7%) responded non-availability of low vision centers, lack of awareness 125(83.3%), low vision service is expensive (n= 69,

46%), lack of interest/ motivation (n = 43, 28.7%), cultural view (n= 31, 21.2%) and cosmetically not acceptable (n = 23, 15.5%) (Table 5).

Table 5

Perceived barriers to the provision of low-vision service for the patients

Barriers	Frequency	Valid Percent
Non-availability of low vision care centers	142	94.7
Lack of awareness	125	83.3
Low vision service is expensive	69	46.0
Lack of interest/motivation	43	28.7
Cultural view	31	21.2
Cosmetically not acceptable	23	15.5

Less than half 67(44.7%) of the study participants were aware of concessions / exceptions / allowance facilities available to low vision patients. The area where the patient with low vision is eligible according to the respondents is listed below in ***table 6***. Eighty (53.3%) respondents mentioned travel as one of the priority areas, 62 (41.3%) income tax concessions and 61 (40.7%) job reservation.

Table 6

Concessions / exceptions / allowance facilities

Concessions	Frequency	Percent
Travel	80	53.3
Income tax concession	62	41.3
Reservation of jobs	61	40.7
Assistance for self-employment	57	38.0
Educational concession	50	33.3
Pension for old age	48	32.0
Bank loans	42	28.0
Telecommunication	42	28.0
Assistance for purchase or fitting of aids and appliances	39	26.0
Postage	31	20.7

On the way of improving low vision practices, majority of the respondents were in support of creating public awareness and creating awareness among practitioners representing 85.3% and 84% of the respondents respectively. The other responses which is summarized in ***table 7*** below include improving the availability of low vision devices (n= 134, 89.3%) and majority were in support of including low vision as part of the residency curriculum (n = 116, 77.3%).

Table 7

Improving low vision practices

Practices	Frequency	Percent
Improving the availability of low vision devices	134	89.3
Creating public awareness	128	85.3
Creating awareness among practitioners	126	84.0
Availability of Low vision devices at low cost:	124	82.7
More training programs	121	80.7
Including Low vision as a part of curriculum	116	77.3

Almost all (96.7%) of the participants had an interest to take part in short term training about low vision. Accessibility issue was raised as the constraint for taking low vision training by the majority (90%) of the

respondents followed by training program being expensive (24%), lack of man power (18.7%), lack of time (10.7%) and lack of interest (6.7%).

Table 8 shows the significant factors associated with each constraint / barrier in providing low vision services. The perception that lack of interest/motivation as a major barrier in providing low vision rehabilitation is significantly higher [OR 3.148(1.459, 6.795)]among those who were knowledgeable than not knowledgeable about low vision services and among those trained in Ethiopia[OR 5.062(1.345, 19.050)] than abroad.

The perception that more work load and lack of man power as a major barrier/constraint is significantly higher [OR 5.444(2.352, 12.603)] among male respondents. The complaint that non-availability and expensiveness of low vision device as a barrier is significantly higher [OR 3.387 (1.103, 10.398)]among those having >/= 5 years of experience.

Table 8

Significant factors associated with barriers of ophthalmic personnel in providing low vision care

Independent variable associated with the barrier	Category Of independent variable	Major barrier Ophthalmology personnel face		Odd ratio(95%CI)	P-Value
		1.Lack of awareness			
		Yes	No		
Knowledge status	Knowledgeable	77	27	2.614(1.265-5.402)	0.009
	Not knowledgeable	24	22		
		2.Lack of training			
		Yes	No		
Low vision rehabilitation services	Yes	9	10	2.614 (1.471, 10.945)	0.007
	No	24	107		
		3. Lack of interest/motivation			
		Yes	No		
Age	≤30	67	30	2.519(1.059, 5.991)	0.037
	>30	45	8		
Sex	Female	19	16	3.560(1.582, 8.012)	0.002
	Male	93	22		
Organization where working	Governmental	103	29	3.552 (1.291, 9.768)	0.014
	None governmental	9	9		
Over all knowledge status about low vision(Score of ≥3 out of 5 score	knowledgeable	85	19	3.148(1.459, 6.795)	0.003
	Not knowledgeable	27	19		
Place where the training is obtained/being obtained	Ethiopia	108	32	5.062(1.345, 19.050)	0.016
	Foreign	4	6		
		4.More work load and lack of man power			
		Yes	No		
Sex of participants	Female	18	17	5.444(2.352, 12.603)	<0.001

	Male	98	17		
		5.Non-availability and expensiveness of low vision device			
		Yes	No		
Experience(years) for participants	≤5Years	7	105	3.387 (1.103, 10.398)	0.033
	>5Years	7	31		
		6.Difficulty in satisfying patients and non-effectiveness of low vision care			
		Yes	No		
Organization where working	Governmental	111	21	3.364 (1.170, 9.672)	0.024
	None governmental	11	7		
		7.Less profitability and time consumption of low vision care			
		Yes	No		
Organization where working	Governmental	120	12	5.0 (1.590, 15.722)	0.006
	None governmental	12	6		

The perception of difficulty in satisfying patients & non-effectiveness of low vision care is significantly higher [OR **3.364 (1.170, 9.672**] among those working in the governmental organizations. The likelihood of belief that LVRS is less profitable and consumes time is significantly higher [OR 5.0 (1.590, 15.722)] among the ophthalmic personnel practicing at governmental organization than those practicing at non-governmental organization.

The likelihood of responding that lack of awareness as the main constraint/ barrier was greater for those who were knowledgeable about low vision rehabilitation [OR 2.614(1.265-5.402)]than not knowledgeable. Lack of training was perceived to be a major constraint for the provision of low vision rehabilitation in a greater proportion of respondents who were from institution giving low vision rehabilitation [OR 4.0125 (1.471, 10.945)] than who didn't provide LVRS.

From the univariate analysis, factors such as age (> 30 years, p=0.037), sex (male, p= 0.002) and type of organization (government hospital, P=0.024) were significant for the constraint that lack of interest/ motivation is the major constraint for the provision of low vision rehabilitation service.

Discussion

A good response rate was achieved in this national survey (72.8%) compared to 65% which was achieved in global survey on low vision service provision from 2011(18).

Generally 89.3% of the participants have good awareness but less knowledgeable (69.3%) about low vision rehabilitation. All of the respondents had heard about low vision services and majority knew about the existence of low-vision devices. Non-availability of low-vision devices and expensiveness of low vision device within the country, lack of training in low-vision practice, lack of awareness, more work load and lack of man power were noted to be the main barriers among eye care practitioners.

This study demonstrated that Non-availability of low-vision devices and expensiveness of low vision device within the country (n =136; 90.67%) as a greatest constraint for application of low vision rehabilitation services. Similarly non-availability of low-vision devices was cited by the greatest proportion of respondents (88%) as a barrier in a study done in Nigeria(19). Non-availability of low-vision devices was also found to be a significant factor among Indian ophthalmologists (72.2%) which is far less than this study. This shows that non-availability of low vision devices and expensiveness of low vision devices are significant problems in Africa than other regions because there is no local production of low vision devices or few if there at all. On another way, only 5.9% (2/34) of participants identified cost as a reason for not obtaining LVS in Spafford et al', study done in 2013 at Canada(20). The possible reason for the difference could be due to the difference in the setup of the research areas because it was done in America where the instruments are readily available and the community living there had better socio-economic status than our setup. The perceived non-availability of low-vision devices in Ethiopia may be a strong indicator to the fact that they are not presently aware that low-vision devices from the Vision 2020 Low-Vision Resource Center of the Hong Kong Society for the Blind are being imported into the country and that most of the simple devices can be produced locally using indigenously available materials and appropriate technology. The prescribing culture of those ophthalmic personnel giving low vision rehabilitation services and the consuming culture of the patients with low vision (end users) could play a role in changing the perception of the non-availability of low-vision devices as a barrier to the provision of low-vision rehabilitation services.

Lack of training in low-vision practice (n =117; 78%) and lack of awareness (n= 49, 32.7%) were noted to be the barriers to the provision of low vision rehabilitation services by the respondents. This has proximity with a study conducted among ophthalmologists in India demonstrating comparable figure(82.3%) responding a lack of training as the major constraints to provide low-vision rehabilitation service but 74.7% of the respondents(more than twice in this study) responded a lack of awareness as one of the major constraints to provide low-vision rehabilitation service(19).Lack of training was also reported by 73.5% of respondents (which was also near to this study) from a survey in Nigeria in 2007 by Okoye et al but lack of awareness of the professional was two times higher from the study at Nigeria (60.2%)(15). Lack of public awareness (60.2%) was one of the major barriers in Nigeria which was slightly lower than this study which was responded by 83.3% of the professionals as one of the common barriers for the applications of low vision rehabilitation in Ethiopia. The majority of the study participants were aware of

vision rehabilitation services (54%) in a study done by Overbury in 2011 at Montreal, Canada which was only slightly higher than in this study(21).

Low vision services are rarely given even at tertiary hospitals in Ethiopia as it is understandable from the report that only 19(12.7%) of the participants were involved in varying levels/scopes of low-vision practice. The result of a Global Survey of Low Vision Service Provision in 2011 was also similar with this finding indicating that most of the African region had either no services, very low/poor coverage or no information could be obtained. The provision of low vision services is related to the availability of trained human resources. The human resource base must be increased by training in low vision services to meet the need for these services. Professionals involved in low vision service include ophthalmologists, optometrists, ophthalmic nurses and rehabilitation workers among others. Therefore, it is very important to find ways to include low vision services as part of different ophthalmic curricula. Effort has to be made at different level of medical education to sensitize increase interest of the medical community to low vision services and to train them to make the appropriate diagnosis and referrals.

More work load with general ophthalmic practice and lack of man power was also mentioned by the Ethiopian ophthalmic personnel representing 34(22.66%) of the respondents as another main constraint. Busy in providing general ophthalmology services (44.3%) was reported by Indian ophthalmologists(19). This figure is twice the figure reported in this study. The possible reason for the difference could be the time of the research which was done 15 years back when there was little number of ophthalmologists and other ophthalmic personnel. The participants of this research were ophthalmologists who were obviously busy with general ophthalmic activities than low vision rehabilitation. Busy in providing general ophthalmology services (56.6) was even higher in the study done in Nigeria among the ophthalmologists in 2007 by Okoye et al (15). The reason for variability could be same as explained above. Again the participants of this study include only ophthalmologists and residents who were most likely busy at general ophthalmic activities. The average ophthalmic personnel invariably spend a tremendous amount of his workday attending to all manners and forms of general ophthalmic cases. The vital complementary roles of the optometrists and other allied eye-care staff should be considered in addressing this perceived barrier. These categories of worker are more likely to devote more time to low-vision care if properly trained.

Lack of interest/ motivation was reported by 25.3% of the respondents. This finding was reported to be slightly higher (42.2%) in a study done by Okoye et al in 2007 among ophthalmologists in Nigeria. Lack of motivation was reported by 54.4% of the participants in a study done in India by Khan SA et al in 2005. This variation might have come from high burden of low vision with low/no low vision rehabilitation service in Ethiopia resulting in higher level of interest and motivation among ophthalmic personnel.

Conclusion And Recommendation

Conclusion

Non-availability of low-vision devices and expensiveness of low vision device within the country, lack of training in low-vision practice, lack of awareness, more work load and lack of man power were noted to be the main barriers among eye care practitioners. Majority of the respondents were in support of creating public awareness and creating awareness among practitioners. The perception that lack of interest/motivation as a major barrier in providing low vision rehabilitation is significantly higher among those who were knowledgeable than not knowledgeable about low vision services and among those trained in Ethiopia than abroad.

Recommendation

Ophthalmologists and other eye care staffs need to get appropriate training in low vision by different ophthalmic societies like ophthalmic society of Ethiopia or NGOs working with them. The concept of low-vision care should be given more attention in the curricula of the ophthalmology residency program and even the undergraduate medical education and in curriculum of other eye care personnel by Ethiopia ministry of education being with Ethiopia ministry of health. Low vision care education / awareness campaigns should be formulated properly targeting the public and eye-care providers. Availability and accessibility of low-vision devices to ophthalmic personnel and the public should be improved by health care administrators found at different levels. Local production/manufacture of low vision device from easily available ingredients should be encouraged.

Limitations And Strength Of The Study

Strengths

- First study conducted in Ethiopia

The potential limitations

- The low response rate is an issue in the web-based questionnaire. We tried to improve the response rate by using hard copy of the questionnaire for the participants lacking internet access and not interested in web-based survey by allocating coordinators at each centers. Email re-sent three times to those who didn't respond within the first two weeks.

Declarations

Ethics approval and consent to participate

The research have been performed in accordance with the Declaration of Helsinki. Ethical clearance & approval was obtained from Institutional Review Board of Jimma University. The committee members include Mubarek Abera <abmubarek@gmail.com and Netsanet Workneh <konetsanet@gmail.com. *All*

participants gave written informed consent to participate in the study. Written informed consent was included in the web-based questionnaire.

Confidentiality of the participants were kept.

- Name avoided from the data.
- Data used only for this research purpose
- Data kept in a well secured manner.

Consent for publication:

Written informed consent for publication was obtained.

Availability of data and materials:

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

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Figures

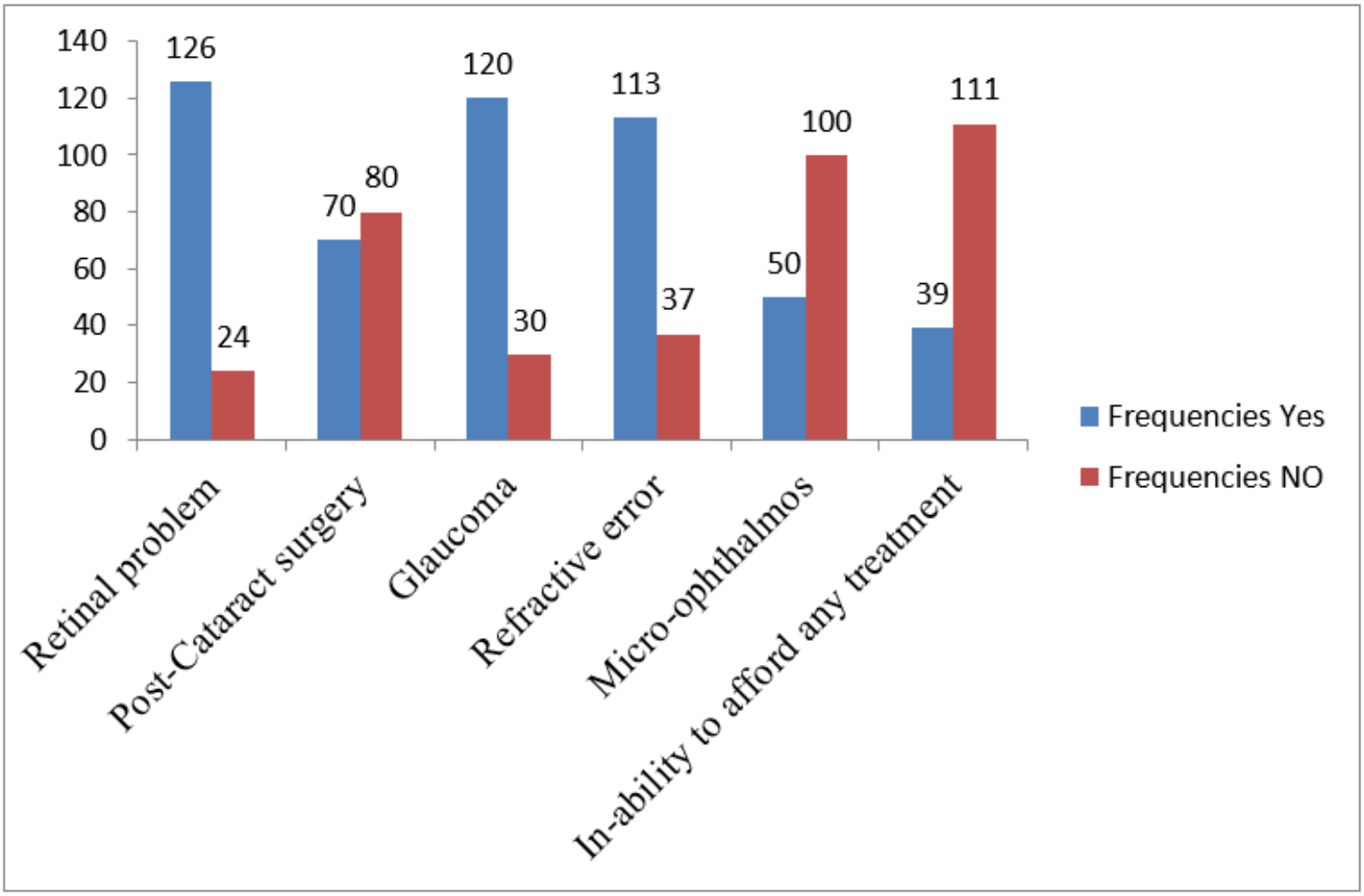

Figure 1

Common causes of low vision that ophthalmic personnel faced while giving eye care services

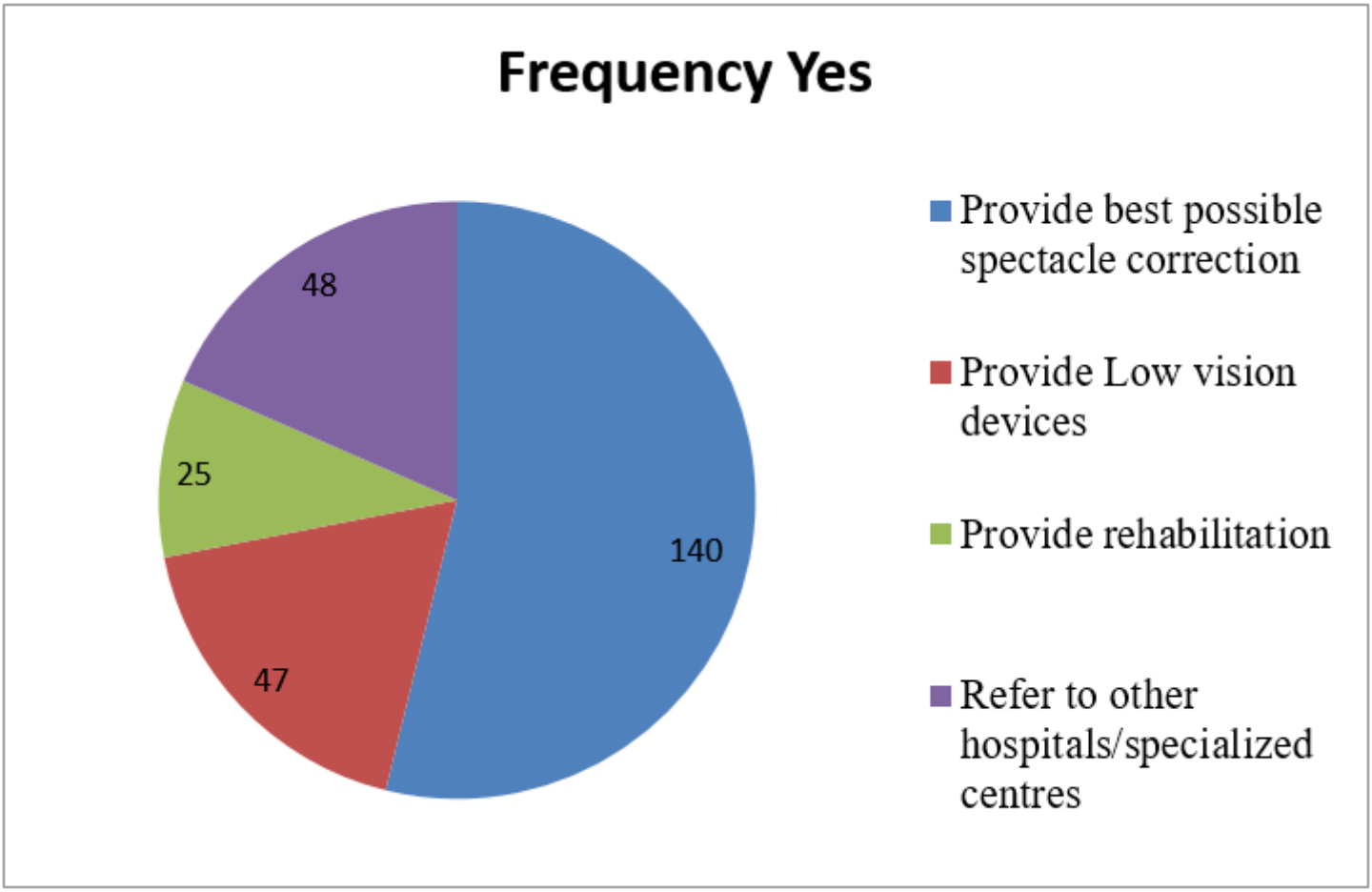

Figure 2

Management of a patient with low vision

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