Barriers to Uptake of Low Vision Assistive Devices Amongst Patients with Low Vision Attending Sabatia Eye Hospital, Western Kenya

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ABSTRACT

Introduction: There is an increase in the burden of low vision, yet the uptake of low vision assistive devices is still very low in developing countries. This study aimed at investigating the barriers to uptake of low vision devices amongst patients who attended Sabatia Eye Hospital low vision clinic in the year 2018.

Methods: Patients' medical records were retrieved from patients' files to obtain data on demographic characteristics, causes of low vision, entry Visual Acuity (VA) and the type of device that were prescribed for the patients. Telephone calls were made to seek consent from the patients and interview them on the use and the barriers to the uptake of low vision assistive devices. A total of 57 questionnaires were completed by the patients.

Results: The majority (82.5%) of patients were using low vision assistive devices, with each level of education recording at least 75% usage of the devices. Concerning marital status, 39 (83%) of the single individuals used the devices while 8 (80%) of the married individuals used the devices. All Muslim participants as well as most Christians used the assistive devices. Uptake of low vision assistive devices was considerably lower amongst participants earning less than 1000 Kenyan shillings a month. The barriers to uptake of low vision devices, from the study, were high cost of the devices (69.2 %) distance from the facility (19.2 %), lack of awareness (3.7%) and long delivery time of the devices to the patients (7.7 %).

Conclusion: Subsidizing the cost of low vision assistive devices, creating awareness amongst the patients and training them on appropriate use of these devices will increase the uptake of low vision assistive devices.

Keywords: low vision, low vision assistive devices, uptake

INTRODUCTION

A low vision person is one who has a visual acuity of less than 6/18 to 3/60, or a visual field of less than 10 degrees from the point of fixation, after best correction with spectacles, medication or surgery (1). At least 246 million people worldwide have low vision (2). In USA the prevalence of low vision is 9.5%, in Europe 10.4 %, in Africa 8.3%, in India 22.2% and in China 27.3% (3). In South Sudan, the prevalence of low vision was found to be 7.7% (4) . The most common causes of low vision being cataract 48.2%, trachoma, glaucoma, macular degeneration, trauma, corneal scars and albinism (3). A study done in Southern Sudan showed that the main causes of low vision were trachoma (58.1%) and cataract

(29.3%) (5). The prevalence of low vision tends to be increasing yet the uptake of low vision devices continues to be low in developing countries (6).

Low vision lowers a person's quality of life by increasing dependency, depression, role difficulties, social limitations, and risk of multiple injuries from falls and banking into objects (7). This poses an economic burden to the affected families and the society at large (8). A study done by (9) found out that low vision patients showed poor level of functioning in activities of daily living and presented with depression, anxiety, and reduced quality of life. Low vision patients have significant distress and reduced quality of life (7). There is a substantial impact of low vision rehabilitation on the quality of life compared to other chronic conditions (10, 7).

Low vision assistive devices improve the quality of life of low vision patients by helping them to make the best of their residual vision to carry out activities of daily living (10). Uptake of the devices also leads to high patient satisfaction (7). It is alarming that most of the people with low vision do not access low vision devices which would have otherwise helped them live a better life (9). These include optical devices, non-optical devices, and other electronic assistive devices. There is need to provide low vision assistive devices to low vision patients to improve both functional status and quality of life of these patients (11). There is a significant improvement in the visual performance of patients with low vision after the prescription and training on the use of low vision devices (12).

According to a study in Ghana, the most frequently issued and used low vision devices was handheld magnifiers for near vision and telescopes for distance vision with varying magnifications (13). These findings were consistent with those of developing countries such as India and Nepal (14). In another study done on Egyptian patients with vision loss, it was found out that for near aids, use of microscopes was at 54%, hand magnifiers

24%, illuminated stand magnifiers 18% and high plus lenses with in-built prisms were at 4 % (12).

Various studies have identified the barriers to uptake of low vision devices. A study done in West Virginia identified poor economic stability and poor transport networks to be the major barriers to uptake of low vision assistive devices (16). In a study done in Melbourne, issues relating to transport, lack of an accompanying person, lack of information about the service and poor health were the main barriers to uptake of low vision assistive devices (15). In India, the barriers to uptake of low vision assistive devices that were identified included: fear (eye damage), cost, ageism, fatalism, and lack of confidence that one would be able to cope up with the assistive devices (17). In Montreal, a study found out that 13% of low vision patients were aware of the low vision services but choose not to utilize them whereas 33% were unaware of the existence of these services (17). In the West Virginia Survey of Visual Health, transportation cost and lack of awareness were the major barriers to uptake of low vision assistive devices (16) . In Canada, almost one third (28%) of the low vision patients reported that they did not know where to access low vision services (18).

Till the time this current research was done, there was a dearth of data on the barriers to uptake of low vision assistive devices by low vision patients who have sought low vision services in hospital in the Kenyan perspective. This study sought to fill these gaps.

MATERIALS & METHODS
Study area
The study was done at a tertiary Eye Hospital, an independent non-profit tertiary eye hospital which has a low vision clinic and serves a huge population across the entire Western Province and parts of Nyanza and Rift Valley provinces.

Study design
The study employed a retrospective study design.

Study Population
All low vision patients who attended low vision clinic from 1st January 2018 to 31st December 2018 formed the study population. This period was chosen because had the most recent information about the status of uptake of low vision devices.

Inclusion criteria
All low vision patients who attended the Sabatia Eye Hospital low vision clinic between 1st January 2018 to 31st December 2018 were included in this study.

Exclusion criteria
patients who had incomplete records and those who did not consent to participate in this study were excluded.

Sample size determination
A census survey was done where the entire population who met the inclusion criteria was used in the study.

Sampling technique
A purposive sampling method was used to select all the low vision cases seen in the year 2018 to 2021 at Sabatia Eye Hospital low vision clinic.

Data Collection Tools
Patients' medical records and questionnaires were used as the data collection tools in this study.

Data collection procedure
Patients' files were retrieved and used to get patient's data which included demographic profile (age, gender, contact address and county of residence), cause of low vision, entry visual acuity and the type of device that were prescribed for the patients.
Contacts of patients were retrieved and used to call patients and those who gave consent were interviewed on telephone. The telephone interview aimed at finding out whether the patient was using low vision assistive devices and any barriers they may have had to acquiring the low vision devices. Each patient's responses were filled out in a questionnaire. The first section contained data on patient's age, gender, county of residence, the patient's address or phone number, the unaided visual acuity, aided visual acuity, the cause of low vision and the type of low vision devices given.

Procedure for data management and storage
Data was collected and recorded on questionnaires. The data was fed into Microsoft Excel file and then cleaned and transferred into SPSS statistical tool. The data files both hard and soft were safely stored on encrypted storage devices.

Procedure for data analysis and presentation
Data was exported in the Statistical Package for Social Sciences (version 24) and analyzed using descriptive statistics as well as inferential statistics Chi-square. Data was presented using percentages, tables, graphs, and pie charts.

Ethical Considerations
Ethical approval for the study was obtained from the institutional research ethics committee (IREC). A written approval was obtained from the director of the eye hospital to conduct this study at their premises and to allow access to medical records of patients that were supposed to be interviewed.
Patient's confidentiality was maintained by ensuring that they were kept anonymous. Patients' files were not taken out of the records room. Respect for autonomy was observed by seeking informed consent from the patients before interviewing them on the telephone. Patient's choices were respected and only those who agreed to participate in the study were included. Beneficence was observed in that patients benefited from the research by getting the relevant information and professional advice on how to maximize

their residual vision.

RESULTS

Out of the total number of patients whose records were retrieved (112), only 57 patients had complete records and consented to participate in this study. This represented 51% of the expected population. The non-respondence was due to incomplete records, patients not being reachable on the phone or not consenting to participate.

Use of low vision assistive devices

Most low vision patients were using low vision assistive devices (82.5%) as compared to (17.5%) who were not using the devices. 47 patients took the devices while only 10 didn't take (See figure 1)
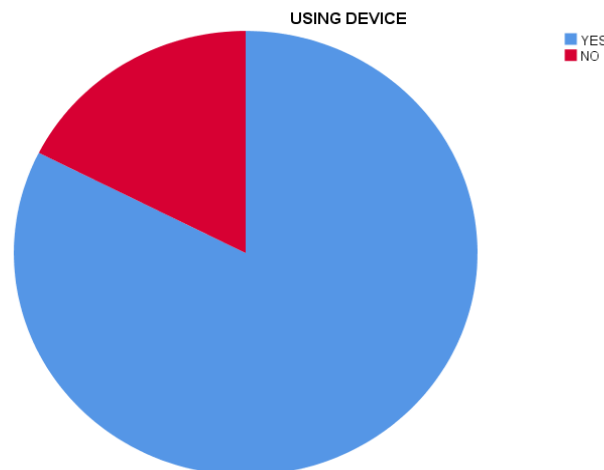
Figure 1: Pie chart showing uptake of low vision assistive devices among low vision patients.

Comparison between use of low vision assistive devices and demographic characteristics
Education level of low vision patients

The findings from this research showed that those who used low vision assistive devices were 22 (75.9%) patients with primary education, 18 (90%) who had attained secondary education and only 7 (87.5%) who had attained tertiary education. (see figure 2)
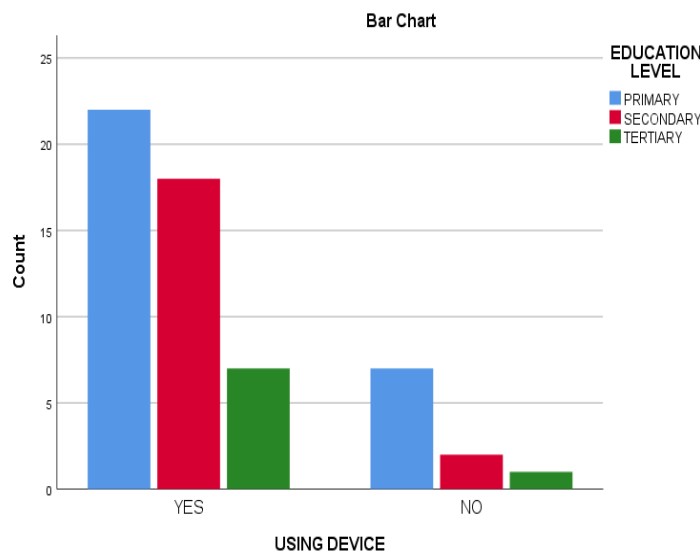

Figure 2: Graph showing use of low vision devices in relation to education.

Income level

The highest uptake of low vision assistive devices was from patients whose income ranged between 5,000 and 20,000 kenyan

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shillings; 25 out of 30 (83%) patients. Amongst those earning below 1,000 Kenyan shillings a month, one (50%) of the patients used the low vision assistive devices. Amongst those earning between 1,000 to

5,000 shillings,15 took the devices (88%) while two did not (12%). Amongst those earning above 20,000 shillings,4 (80%) took the assistive devices while only 1 didn't take. (See figure 3).
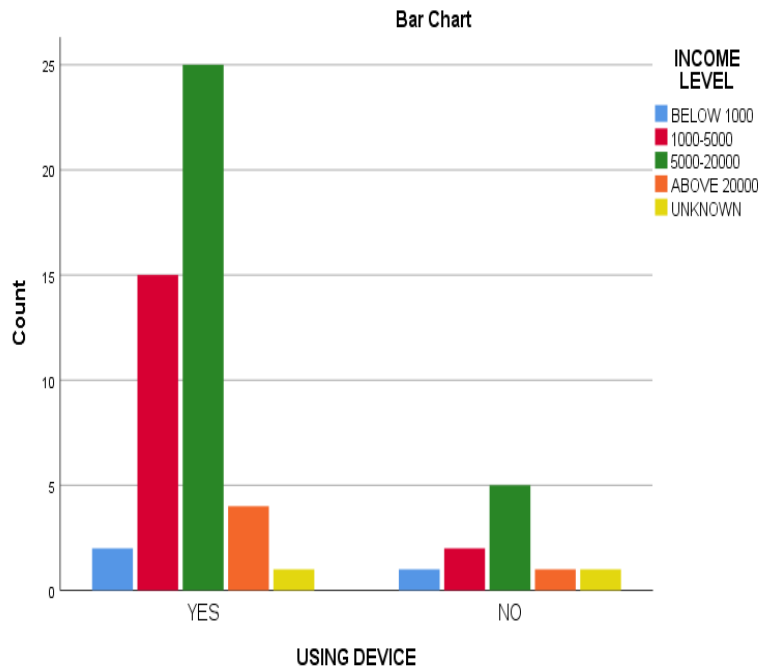

Figure 3: Graph showing use of low vision devices in relation to income distribution of patients.

Occupation

The majority (39) of the patients who took the devices were school going children

while the working class - teachers, electricians, businesspersons, pastor tailor and farmers were only 8. (See figure 4)
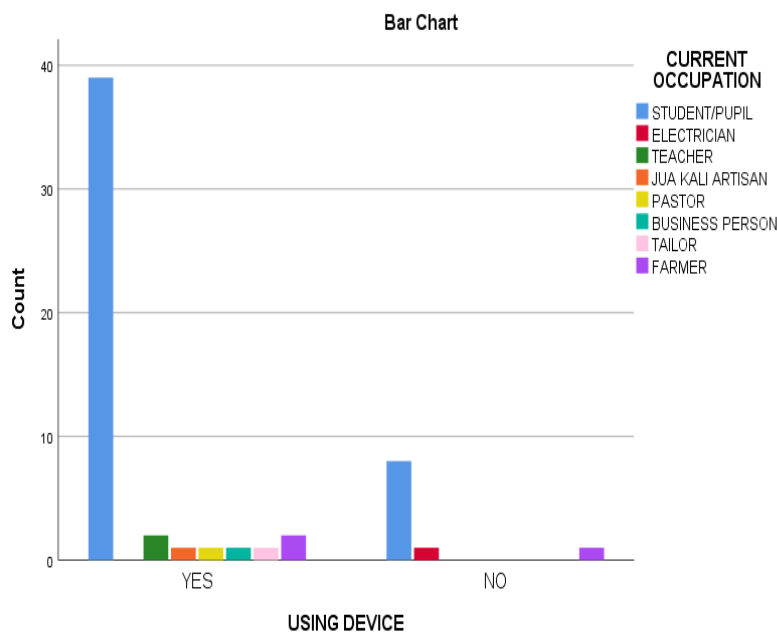

Figure 4: Graph showing use of device in relation to various occupations of the patients.

Marital status

From this study it is evident that 39 (83%) of the individuals who were single took the devices while 8 (80%) of the married individuals took the devices. This indicates that there is a slightly higher uptake of low vision assistive devices amongst individuals who were single as compared to the married. This is illustrated in figure 5 below.
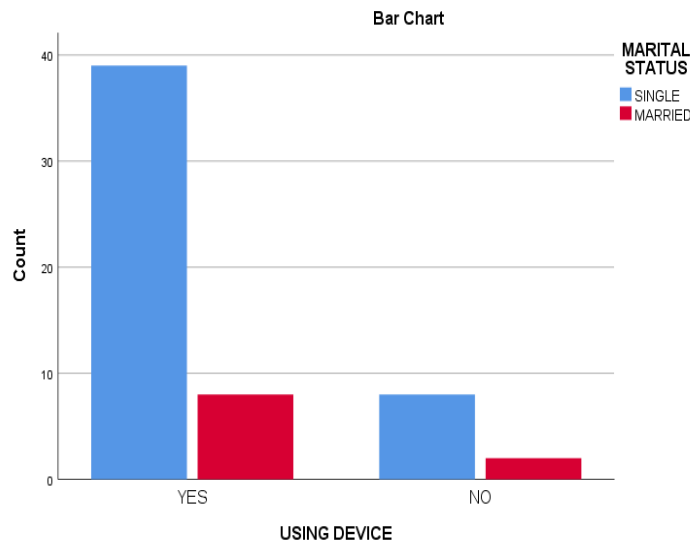

Figure 5: Graph showing use of device in relation to marital status of patients.

Religion

The majority, 42 out of the 47 Christian participants in this study used low vision assistive devices whereas all the Muslim participants used low vision assistive devices. (see figure 6)
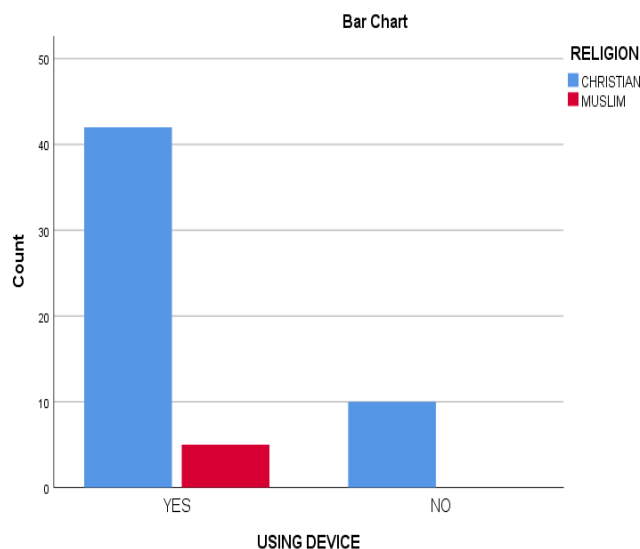

Figure 6: Graph showing use of devices in relation to religious states of the patients.

Barriers to uptake of low vision devices

The highest barrier to uptake of low vision device was high cost (69.2 %). Other barriers included distance from the facility (19.2 %), lack of awareness of the devices by the patients (3.7%) and the time taken by the devices to be availed to the patient (7.7%). (See figure 7 below)
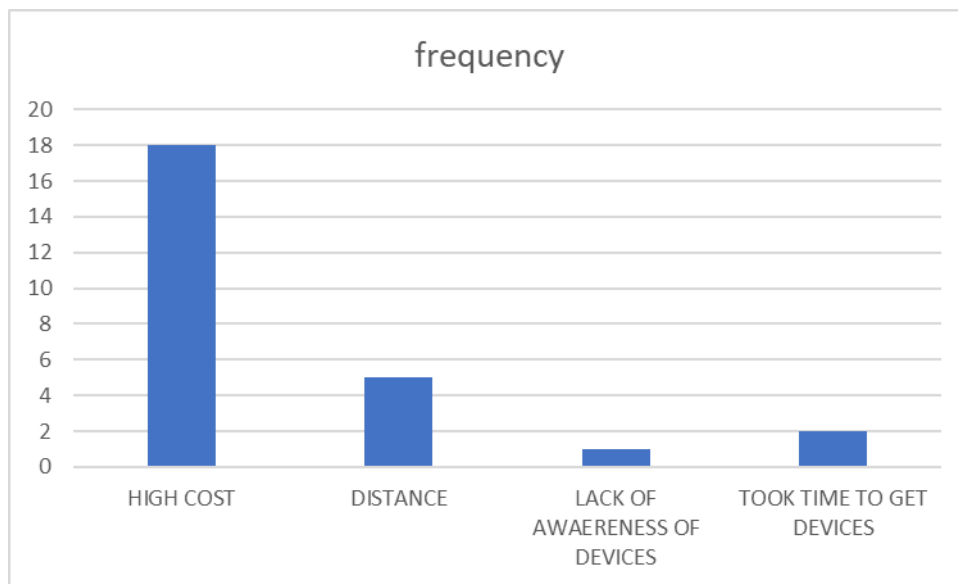
Figure 7: Graph showing barriers to uptake of low vision devices.

DISCUSSION

Comparison of uptake of low vision assistive devices across different demographic characteristics

Most of the research participants were using low vision assistive devices while only a few did not. Similarly, previous research has revealed uptake of low vision assistive devices by most participants in Malaysia (19).

In the study, there was a higher number of males using low vision assistive devices as compared to females. This contradicts with results from a previous study which showed that females with low vision had a higher percentage of use of low vision assistive devices as compared to male low vision patients (20). A study conducted in Ethiopia also found out that prevalence of low vision was higher in females than in males (21). On the other hand, a survey on gender and eye health had indicated that there were more women with low vision than men and low uptake of assistive devices by women could be because women prioritize other family activities like baby sitting and may not find time to seek the low vision services they need (22). The disparity could be an indication that change might have taken place from the time this previous study was done till now.

The highest number of patients using low vision assistive devices were those who had only attained primary level of education and the numbers decreased with the increasing level of education achieved. The highest users of low vision assistive devices were primary school going pupils followed by secondary school students and lastly tertiary education persons. However, the percentage of those using low vision assistive devices was high in each of the three groups, with each group recording at least three quarters of their population as using low vision assistive devices. The lower uptake of low vision assistive devices amongst the adults is consistent with results from a previous study in Nigeria which found out that the elderly underutilize the low vision services offered (23).

There was a slightly higher percentage of uptake of low vision assistive devices amongst patients with a higher income as compared to those with low income. Lower percentage was noticed in patients who earned below 1000 Kenyan shillings per month although total number of these participants were fewer than the rest. Low vision patients find it difficult to engage in work activities due to lack of social support (24). This could result in such patients opting for only the low paying jobs. Moreover, low vision patients might fail to meet the visual demands for some of the well-paying jobs and print access and

technology is a major stress to these patients (25).

There were more Christian than Muslim participants in this study. All the Muslims as well as the vast majority of Christians used the low vision assistive devices. The results contradict what would have been expected, considering that a previous study found out that spirituality and religiousness had a negative effect on the rehabilitation goals for low vision patients (27). In this study, the two religions that were represented recorded a high percentage in the uptake of low vision assistive devices and this ais a positive impact.

There were more single patients using low vision assistive devices as compared to the married. This could be attributed to the fact that most of these were school-going pupils and students. This contradicts the findings of a previous study which indicated that there having a helper, a spouse, in the home would most likely increase the uptake of assistive devices (26).

Barriers to uptake of low vision assistive devices.

In this study, the most prevalent barrier to uptake of low vision assistive devices was the high cost of the devices. These results concur with those of Adam and Pickering who found out that the barriers to uptake of low vision assistive devices were: fear of eye damage, cost, ageism, fatalism, and having a negative attitude towards the ability to cope up with the device 9). A study in west Virginia also reported the same results (16).

The long distance to the facility was another barrier that was identified in this study. This could be tied to the financial status of the patients. These results are consistent with another research done by Lam and Leat whose study reported that 17% of the patients reported that the services were too far away and transportation was a barrier to them (18). Similarly, a study in West Virginia Survey of Visual Health reported that transportation was the main barrier to acquisition of low vision assistive devices

(16). Chang et al also found transport as a major factor hindering uptake of low vision assistive devices (15). A study done in Nigeria also reported that poor access to the low vision facilities was a major barrier to uptake of low vision assistive devices (28).

Another barrier that was reported is the time taken for the devices to be availed to the patients. This was reported by only a few of the patients who claimed that the devices were only delivered after a long time of waiting. There is a dearth of literature on this barrier and more studies may be done to investigate further into this matter.

Lack of awareness of the existence or importance of low vision assistive devices was another barrier. These results are similar to those of a study in Nigeria which reported that a high percentage (88.9%) of low vision patients were ignorant of the devices (28).This is also similar to a study in Montreal that reported that 33% of low vision patients were unaware of the existence of low vision assistive devices (17). A study done in Virginia also reported that lack of knowledge about low vision services was a major concern, with only 18% of the participants being aware of the existence of these devices (16). From the various studies highlighted from different parts of the world, lack of awareness is a serious barrier to the uptake of low vision services and devices across the world and is a major concern that should be addressed.

CONCLUSION

According to the findings of this study, the main barrier to uptake of low vision devices is the high cost of the devices which is attributed to the low economic status of the majority of the population. Other barriers include the distance to the facility, time taken for the prescribed device to be availed to the patient and ignorance of the availability of the low vision assistive devices. There is need to address each of the barriers that have been highlighted to improve the quality of life of low vision patients in Kenya.

REFERENCES

1. World Health Organization. (2018). Low Vision. https://www.who.int/blindness/causes/priority/en/index2.html

2. Oduntan, A. O. (2005). Prevalence of low vision among school children in the Cape Coast Municipality of Ghana. *International Congress Series*, 1282, 747-750.

3. Liang, Y., Jaran, L. A., Munoz, B., Rosado, J. S., Bandeen-Roche, K., Vingerling, J. R., & West, S. K. (2008). Visual impairment and blindness in Spanish Americans: the Proyecto VER. *Archives of Ophthalmology*, 126(10), 1427-1434.

4. Ngondi, J., Ole-Sempele, F., Onsarigo, A., Matende, I., Baba, S., Reacher, M., ... & Nkurikiye, J. (2006a). Prevalence and causes of blindness and low vision in southern Sudan. *PLOS Medicine*, 3(12), e477.

5. Ngondi, J., Ole-Sempele, F., Onsarigo, A., Matende, I., Baba, S., Reacher, M., ... & Nkurikiye, J. (2006b). Prevalence and causes of blindness and low vision in southern Sudan. *PLOS Medicine*, 3(12), e477.

6. Binns, A. M., Bunce, C., Dickinson, C., & Harper, R. (2012). How effective is low vision service provision? A systematic review. *Survey of Ophthalmology*, 57(1), 34-65.

7. Cahill, M. T., Teske, M. P., & Stanfield, M. J. (2005). Vision rehabilitation: a multidisciplinary care model for patients with visual impairment. *Theoretical medicine and bioethics*, 26(3), 243-258.

8. Roberts, C. B., Hiratsuka, Y., Yamada, M., Pezzullo, L., Yates, K., & Takano, S. (2010). Economic cost of visual impairment in Japan. *Archives of Ophthalmology*, 128(6), 766-771.

9. Kempen, G. I., Ballemans, J., Ranchor, A. V., van Rens, G. H., Zijlstra, G. R., & Armbrecht, A. M. (2012). The impact of low vision on quality of life in 10-year-old children. *Opthalmic and Physiological Optics*, 32(6), 535-547.

10. Langelaan, M., de Boer, M. R., van Nispen, R. M., Wouters, B., Moll, A. C., van Rens, G., & de Boer, M. R. (2007). Impact of visual impairment on quality of life: a comparison with quality of life in the general population and with other chronic conditions. *Ophthalmic Epidemiology*, 14(3), 119-126.

11. Stelmack, J. A. (2001). Tangible benefits of low vision devices. *Journal of Rehabilitation Research and Development*, 38(6), 713-722.

12. Shaaban, Y. M., Hsu, J., Burd, R. S., Holck, D. E., Meredith, T. A., & Dutton, G. N. (2009). Visual rehabilitation in adolescents with cortical visual impairment. *American Journal of Ophthalmology*, 147(4), 700-706.

13. Ackuaku-Dogbe, E. M., Amedo, A. O., & Abokyi, S. (2016). Pattern and causes of visual impairment among the blind and visually impaired in Southern Ghana. *Ghana Medical Journal*, 50(2), 91-97.

14. Khan, M. A. (2000). Survey of visual impairment in Nepal. *Nepal Journal of Ophthalmology*, 3(1), 12-15.

15. Chiang, P. P., O'Connor, P. M., Le Mesurier, R. T., Keeffe, J. E., & Taylor, H. R. (2011). A global survey of low vision service provision. *Ophthalmic Epidemiology*, 18(3), 109-121.

16. Walter, N., Griffin, J. R., & Kahook, M. Y. (2004a). Structural features and barriers to using low vision devices: a qualitative study of community-dwelling visually impaired older adults. *Investigative Ophthalmology & Visual Science*, 45(1), 134-134.

17. Overbury, O., & Wittich, W. (2011). Barriers to low-vision rehabilitation services in Quebec. *Canadian Journal of Ophthalmology*, 46(2), 133-137.

18. Lam, N. T., & Leat, S. J. (2013). Barriers to accessing low vision services. *Ophthalmic and Physiological Optics*, 33(1), 38-44.

19. Mohidin, N., & Yusoff, S. (1998). Assistive technology: Its impact on the daily lives of blind and low vision persons. *Rehabilitation Counseling Bulletin*, 42(3), 196-210.

20. Kingo, K., & Ndawi, B. (2009). Vision-related quality of life and visual function in low-vision patients after transition training in a rehabilitation center. *Clinical and Experimental Optometry*, 92(6), 488-495.

21. Berhane, Y., Worku, A., Bejiga, A., & Adamu, L. (2007). Prevalence and causes of blindness and low vision in Ethiopia. *Ethiopian Journal of Health Development*, 21(3), 204-210.

22. Courtright, P., & Lewallen, S. (2009). Women's views of barriers to seeking eye care in rural Malawi. *The Journal of Ophthalmology of Eastern, Central and Southern Africa*, 13(1), 51-54.

23. Olusanya, B. A., Ashaye, A. O., & Ejere, H. O. (2012). The pattern of presentation of low vision in Nigerian adults and its influence on quality of life. *Eye*, 26(3), 419-426.

24. Elliott, D. B., Trukolo-Ilic, M., Strong, J. G., Pace, R., Plotkin, A., & Bevers, P. (1997). Demographic characteristics of the vision-impaired elderly. *Investigative Ophthalmology & Visual Science*, 38(12), 2566-2575.

25. Naraine, M., & Lindsay, S. (2010). An ethnographic study of factors influencing the low vision rehabilitation process in an Ophthalmology Department at a Canadian teaching hospital. *Canadian Journal of Occupational Therapy*, 77(2), 99-108.

26. Watson, G. R., De l'Aune, W. R., Williams, B. M., & Linton, K. L. (1997). Marital status, marital closeness, and low vision rehabilitation: A longitudinal study. *Rehabilitation Psychology*, 42(3), 177-191.

27. Brennan, M., & MacMillan, T. (2008). Low vision and spirituality. *Journal of Visual Impairment & Blindness*, 102(5), 309-319.

28. Udeh, B. L., Schneider, J., van Landingham, S. W., Chen, D., Bregman, B., Shah, M., ... & Ramulu, P. Y. (2014). Glaucoma and disability: which tasks are affected, and at what stage of disease? *Journal of Glaucoma*, 23(6), 396-40

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