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Vision-specific and psychosocial impacts of low vision among patients with low vision at the eastern regional Low Vision Centre

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Purpose: To determine vision-specific and psychosocial implications of low vision among patients with low vision visiting the Low Vision Centre of the Eastern Regional Hospital in Ghana.

Methodology: This was a descriptive case-control study of 41 patients with low vision and 41 patients with normal vision recruited from the Low Vision Centre of the Eastern Regional Hospital by simple random sampling. Data on vision-specific and psychosocial impacts of low vision was collected using the National Eye Institute Visual Function Questionnaire-25 (NEI VFQ-25). Biographical and clinical characteristics such as age, gender, educational status, marital status, employment and income status were gathered from consenting patients. Mann–Whitney U analysis using Statistical Package for Social Scientists (SPSS) was conducted to compare scores on vision-specific and psychosocial subscales of the NEI VFQ-25 between patients with low vision and patients with normal vision.

Results: Patients with low vision recorded the lowest score on the driving subscale (median = 8.33, IQR [interquartile range]: 8.33–41.67, $n = 41$, $p < 0.001$), as well as on distance activities (median = 35.42, IQR = 16.70–58.80). Psychosocial implications of low vision included high dependency (median = 33.33, IQR = 25.00–50.00), reduced mental health (median = 37.50, IQR = 25.00–50.00) and limitation in partaking in social activities (median = 50.00, IQR = 37.50–78.00).

Conclusion: Low vision has both vision-specific and psychosocial implications for the patients. Low vision management and services should therefore be tailored to meet these psychosocial and vision-specific needs to enable patients better accept their visual changes and to be better prepared to use their remaining vision to achieve their daily goals.

Introduction

Low vision is considered a form of impaired visual function that exists despite treatment of any existing ocular disease and correction of refractive error, and is defined as decreased vision in the better eye worse than a visual acuity of 6/18 but better than light perception and/or a visual field constriction to less than 10° from point of fixation, with a potential to use remaining vision for planning or the execution of one's daily task.[1,2] Global and regional prevalence of low vision is on the increase,[3,4,5] making it an important public health issue. The challenge of managing low vision is enormous with huge economic implications.[6,7] Low vision is said to have implications for visual function and psychosocial well-being which may include the ability to perform activities of everyday living, depression or mental health and driving.[8,9,10] In developed countries, many studies have been conducted to understand the specific visual, functional and psychological challenges patients with low vision face which have informed management, intervention programs and services in those countries.[11,12] However, in Ghana, very few studies[13] have been conducted to assess the visual and psychosocial implications of low vision on patients living with low vision although the national population census conducted in 2010 in Ghana indicated growing incidence of low vision in the country[14] for which reason a Low Vision Centre has been established to manage such patients. Understanding the specific challenges faced by patients with low vision is relevant in directing management and low vision services in Ghana with available and scare resources to improve quality of life, enable patients perform their everyday task and fit in society. This study therefore sought to determine the vision-specific and psychosocial impacts of low vision on patients with low vision.

Methodology

This was a descriptive case-control study of 41 patients with low vision (cases) and 41 patients with normal vision (controls) attending the Low Vision Centre of the Eastern Regional Hospital, Ghana, from 01 December 2015 to 31 March 2016. The Low Vision Centre is the main centre in the country where all low vision referrals are managed. The main outcome measure was a composite score calculated through the use of the National Eye Institute Visual Function Questionnaire (NEI VFQ-25). The total minimum sample size to effectively compare each section of the NEI VFQ-25 was found to be 82 ([36*2] + 10%), based on power of test of 0.8 (the least reasonable power of a hypothesis test). Observations were not paired. The alpha value or significance was set at 0.05 for a two-tailed test. From the literature,[15] a large difference was expected of at least 20 points on the composite score. Median scores were compared and confidence was set at 95%. Cases were patients attending the Low Vision Centre who had previously been examined and diagnosed with low vision according to World Health Organization Classification[1] by the low vision specialist of the centre, the ophthalmologist and two optometrists.

Cases were re-examined by the low vision specialist and ophthalmologist to confirm the presence of low vision and to establish visual acuity using early treatment diabetic retinopathy (EDTRS) charts and LogMAR charts for near vision, and cause of low vision through Slitlamp examination, Funduscopy and low vision assessment. Forty-one age–gender-matched patients with normal vision (controls) attending the eye clinic of the same hospital for other eye-related conditions other than low vision were also selected and studied using convenient sampling technique. The NEI VFQ-25 was used for data collection. It has vision-specific subscales that include near and distance vision, colour vision, peripheral vision and driving. Psychosocial subscales on NEI VFQ-25 questionnaire include dependency, social function, mental health and role difficulty (Figure 1). Scoring on NEI VFQ-25 was in accordance with that proposed by the manufacturer.[15] The NEI VFQ-25 was used without amendment but was pretested and validated for use among the sample with Cronbach's alpha coefficient of 0.98. Demographic and biographic data including age, gender, employment, education and marital status were also collected. The data were analysed using the Statistical Package for Social Scientists (SPSS, Version 23, Chicago, IL). Descriptive statistics and Mann–Whitney *U* test analysis were done.

Ethical consideration

The study protocol adhered to tenets of the Declaration of Helsinki for research involving human subjects. Ethics approval from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal and ethics committee of the Ghana Health Service, permission from the Eastern Regional Hospital administration and written informed consent from both cases and controls were obtained before the conduct of the study.

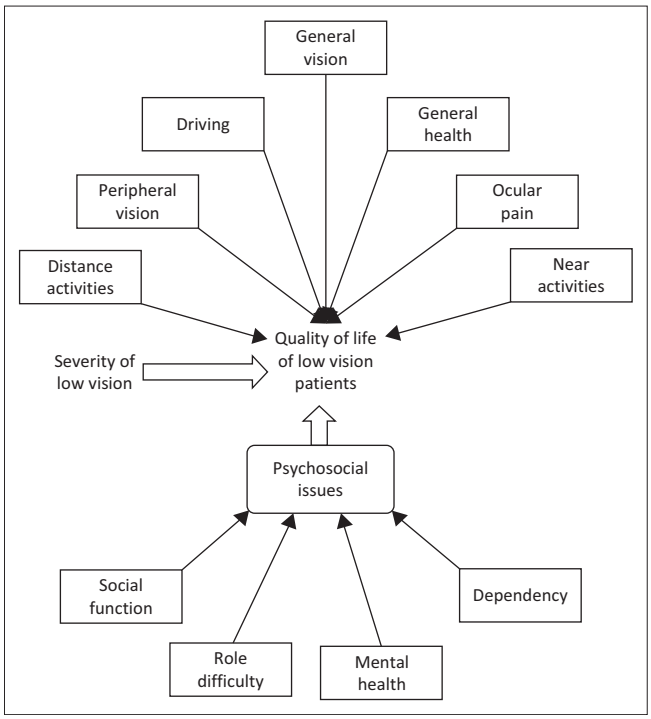

FIGURE 1: Psychosocial and vision-specific aspects of NEI VFQ-25 questionnaire.

Results

The sample consisted of 41 cases and 41 controls. There were 27 (65.85%) male patients and 14 (34.15%) female patients among the cases. There were 16 (39.02%) male participants and 25 (60.98%) female participants in the control group. The age range of the studied sample ranged from 17 to 80 years. The median age of cases (35.50, IQR [interquartile range]: 21.00–62.00) and controls (36.50, IQR: 28.00–50.00) was similar. In this study, cases presented with much lower quality of life scores in comparison with the control group (median composite score for cases 46.09 (IQR: 30.80–66.00) and for controls 98.09 (IQR: 94.90–100.00), $p < 0.001$).

The proportion of unemployed patients with low vision (51.22%) compared to patients with normal vision (9.76%) was significantly higher, with Fisher's exact test showing a significant $p < 0.001$. There was also a higher proportion of government-employed patients with normal vision (46.34%) compared to patients with low vision (9.76%), with Fisher's exact test showing a significant $p < 0.001$. The proportion of patients with low earning income status was significantly higher among patients with low vision (53.66%) compared to normal vision patients (26.83%), with Fisher's exact test yielding a significant value, $p = 0.040$. There was no significant difference in the educational and marital status of cases and controls ($p = 0.423$ and $p = 0.657$), respectively.

Cataract (19.51%) and refractive error (19.51%) were the most prevailing causes of low vision among the cases (Table 2). Glaucoma (14.63%) was the second commonest condition among the cases. Other less frequent conditions that resulted in low vision were corneal opacity, amblyopia, keratoconus, retinitis pigmentosa, retinopathies, nystagmus and albinism.

TABLE 1: Demographic profile of studied subjects (n = 82).

Background characteristic	Cases (n = 41)		Controls (n = 41)	
	Frequency (n)	Percentage	Frequency (n)	Percentage
Age (years) distribution				
< 40	21	51.22	25	60.98
40–60	7	17.07	12	29.27
> 60	13	31.71	4	9.75
Gender distribution				
Male	27	65.85	16	39.02
Female	14	34.41	25	60.98
Employment				
Unemployed	21	51.22	4	9.76
Government employee	4	9.76	19	46.34
Self employed	10	24.39	15	36.59
Retired	6	14.63	3	7.32
Income				
None	6	14.63	1	2.44
Low income (< GH₵ 1000)	22	53,66	11	26.83
Middle income (GH₵ 1000–5000)	9	21.95	10	23.39
High income (GH₵ > 5000)	4	9.76	19	46.34
Education				
Uneducated	6	14.63	5	12.20
Basic	5	12.20	5	12.20
Secondary	16	39.02	10	24.39
Tertiary	14	34.15	21	51.22
Marital status				
Single	18	43.90	17	41.46
Married	18	43.90	20	48.78
Divorced	0	0.00	1	2.44
Widowed	5	12.20	3	7.32

GH₵, Ghanaian Cedi.

TABLE 2: Causes of low vision among cases (n = 41).

Cause	Frequency (n)	Percentage
Cataract	8	19.51
Uncorrected refractive error	8	19.51
Glaucoma	6	14.63
Maculopathy	5	12.20
Cornea opacity	3	7.32
Nystagmus and albinism	3	7.32
Amblyopia	2	4.87
Keratoconus	1	2.44
Multiple cause	2	4.87
Retinopathies	2	4.87
Retinitis pigmentosa	1	2.44
Total	**41**	**100.00**

Discussion

Demographics and clinical characteristics of cases

Cases were diagnosed with low vision at age (median = 34.50, IQR: 38.50–45.00) similar to those reported in other developing countries but early compared to developed countries.[16,17] Cataract and refractive error were the most common causes of low vision (≈ 20% each). Equal frequency of cataract and refractive error (Table 2) could be because of this study. Global and Africa-specific[18,19,20] data have cataract as the leading cause of low vision in developing countries. The fact that cataract and refractive error continue to be the major cause of low vision coupled with early age of low vision reflects inadequate vision care, high cost of cataract surgeries, lack of accessible and affordable vision care and/or glasses for refractive error correction and unwillingness on the part of patients to access vision care because of poverty.[21]

TABLE 3: Comparison of National Eye Institute Visual Function Questionnaire 25 scores of cases (n = 41) with controls (n = 41), with significance set at $p < 0.05$.

QOL subscales	QOL scores for cases (median and IQR)		QOL scores for controls (median and IQR)		p
	Median	IQR	Median	IQR	
Driving*†	8.33	8.30–41.70	100.00	100.00–100.00	< 0.001
Dependency*	33.33	25.00–50.00	100.00	100.00–100.00	< 0.001
Distance activities†	35.42	16.70–8.80	100.00	100.00–100.00	< 0.001
Mental health*	37.50	25.00–50.00	100.00	93.80–100.00	< 0.001
General vision†	40.00	20.00–60.00	100.00	80.00–100.00	< 0.001
Near activities†	50.00	16.70–66.70	100.00	100.00–100.00	< 0.001
Social function*	50.00	37.50–78.10	100.00	100.00–100.00	< 0.001
Role difficulty*	50.00	25.00–62.50	100.00	100.00–100.00	< 0.001
Colour vision†	50.00	25.00–100.00	100.00	100.00–100.00	< 0.001
Peripheral vision†	50.00	25.00–100.00	100.00	100.00–100.00	< 0.001
General health	75.00	50.00–75.00	100.00	100.00–100.00	< 0.001
Ocular pain*	87.50	71.90–100.00	87.50	87.50–100.00	0.098
Composite score	**46.09**	**30.80–66.00**	**98.09**	**94.90–100.00**	**< 0.001**

QOL, quality of life; IQR, interquartile range.
*, psychosocial subscales.
†, vision-specific subscale.

Proportion of unemployment (Table 1) among cases was higher (51.22%) compared to controls (9.76%) (Fisher's exact test, $p < 0.001$), which reflects a global phenomenon.[22,23] Patients with low vision have been found to be more likely to be unemployed, loss their job or underpaid for job done.[22,23,24,25] Reasons often given for this situation include inability of employers to punish because of possible law suits, non-performance on the job because of limitation placed on patients with low vision and lack of knowledge in dealing with patients with low vision.[26,27,28]

Vision-specific impact of low vision

Vision-specific subscale of the NEI VFQ-25 impacted by low vision included driving (median = 8.33, IQR = 8.30–41.70), distance (median = 35.42, IQR = 16.70–58.80) and near (median = 50.00, IQR = 16.70–66.70) activities, colour vision (median = 50.00, IQR = 25.00–100.00), peripheral vision (median = 50.00, IQR = 25.00–100.00) and general vision (median = 75.00 IQR = 50.00–75.00) (Table 3). Cases recorded the least score on the driving subscale in agreement with the study in Nepal.[11] Driving has implications for quality of life where research has shown that cessation of driving is associated with depression, less social interaction and limited job opportunities.[11] Unlike subjects with low vision in some developed countries who may be privileged to have sophisticated low vision aids such as the visual field expanders and bioptic telescopes to enable them to drive,[29] low vision subjects in this study did not have access to such aids. This probably explains why most of the cases that used to drive, either completely stopped driving or barely drove. Although the subjects in the study by Fonda et al.[29] were elderly patients than those in this study, low vision appears to produce similar effects on driving. This could be because of the fact that driving is a visually demanding task and the quality of vision required to execute the driving task is the same irrespective of age.

Low vision limited the distance and near vision ability among cases (Table 3). The impact of low vision on distance vision was found to be greater than near vision in our study contrary to similar studies in Nigeria[3] and Tanzania.[30] One possible reason could be because of the overall age distribution of the cohort in this study being a younger age category, whereby people are predominantly occupied in activities that require distance vision such as driving being more utilised. Cases and controls did not however differ in their score on ocular pain and discomfort subscales (Table 3), $p = 0.098$; therefore, the experience of pain and discomfort was similar in both groups. The similar experience of ocular pain and discomfort subscale among cases and controls may be because of many factors which may include, but not limited to, social support that alleviates pain[31] and religious beliefs[32] that enable people to endure suffering, pain and discomfort, therefore making the experience of pain and discomfort a less contributing factor to reduced quality of life among cases. Furthermore, most causes of low vision do not have ocular pain as an associated factor. The role of religion in helping persons with disability could be an important factor among the cases considering that Ghana is a very religious country.[14,33]

Psychosocial impact of low vision

Cases recorded low score compared to controls on psychosocial subscales of the NEI VFQ-25 such as mental health (Table 3). In 2012, Omar et al.[34] discussed that even mild low vision was significantly associated with reduced mental health. In this study, dependency and mental health were the most affected psychosocial subscales of the NEI VFQ-25. High correlations between low vision and emotional distress have been found to exist.[35,36] The psychological implication of low vision suggests the need for mental health assessment or psychological intervention in low vision assessment. In Ghana however, access to such services is limited.

Difficulty participating in social functions such as visiting friends and carrying out activities of daily living characterised the experience of the cases, therefore creating high dependency. This finding is consistent with other studies.[37,38] Berger et al.[39] and Warren[38] reported from their studies that low vision was the third most common chronic condition for which people required some form of assistance in carrying out activities of daily living. Berger and Porell[8] also reported that decreased vision is positively associated with reduction in activities of daily living.

Although low vision affects the different quality of life subscales independently, there exist a complex interaction among these subscales of the NEI VFQ-25 where a defect in one subscale tend to produce an effect on another.[40] For instance, cessation of driving has been found to negatively affect mental health by causing depression, and peripheral and colour vision loss affect driving.[40,41]

Conclusion and recommendations

Low vision intervention programmes and services need to address the vision-specific and psychosocial challenges imposed on patients with low vision to improve their quality of life. A multi-disciplinary team consisting of optometrists, low vision specialists, orientation and mobility therapists and psychologists working with low vision patients may enable them to psychologically better handle the situation and its limitations, facilitate access to low vision services and fulfil activities of daily living. It is critical that government policies take into account making cataract surgeries and spectacles accessible and affordable to patients who need them to prevent low vision. Furthermore, government services need to be aligned to the needs of the low vision patients, a major challenge in developing and poor countries. There is the need for further studies on interventions, the relation between severity and/or duration of low vision and level of impact on quality of life. A randomised control study will be very useful in providing greater insight into these issues.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

B.A. was the principal investigator responsible for data collection, data analysis and preparation of manuscripts. K.S.N. and P.G. played supervisory roles, conceptualised the project and ensured the quality of the manuscript.

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