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Impact of self-reported visual impairment on quality of life in the Ibadan Study of Aging

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Abstract

Background—Information is lacking on the impact of visual impairment on the quality of life of elderly Africans. This study aims to examine the impact of self reported visual impairment on the quality life of an elderly Nigerian sample.

Methods—A multi-stage stratified sampling of households was implemented to select persons aged 65 years and over (n = 2054) in the south-western and north-central parts of Nigeria. Impairments of distant and near vision were based on subjective self-reports obtained with the use of items derived from the World Health Organization (WHO) multi-country World Health Survey questionnaire. Estimates of quality of life scores were made for normal sighted and visually impaired individuals using the WHO Quality of Life instrument, brief version (WHOQoL-Bref) .

Results—Four hundred and fifty three (22.3%) of the respondents reported impairment for distant vision, 377 (18.4%) for near vision while 312 (15.2) reported impairment for both far and near. Impairment of near vision had a significant impact on all domains of quality of life. Distant vision had less impact, with significant decrement only in the domain of environment. After adjusting for the possible effects of age, sex, and co-occurring chronic physical illness, near vision impairment accounted for 3.92% decrement in the overall quality of life of elderly persons.

Conclusion—Impairment of vision is associated with significant decrement in diverse areas of quality of life in this elderly sample. Problems with near vision were nevertheless more likely than those of distant vision to affect quality of life.

Keywords

vision impairment; quality of life; elderly population

Introduction

Visual impairment is a global public health problem.¹ With increasing proportions of the elderly in different populations, the public health significance of visual impairment is likely to grow.² An important consequence of visual impairment is its effect on the quality of life of the elderly. Several reports have shown that poor vision reduces the quality of life^{3,4}. The

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Competing interest: None declared.

Project over study observed that visual acuity impairment, in both the better- and the worse-seeing eyes, was associated with a decrease in quality of life domains and the steepness of that decrease was associated with level of visual impairment.⁵ A study which evaluated the effect of impaired vision on health-related quality of life of 1361 elderly Taiwanese observed that impaired vision was associated with significantly lower scores on physical and social functioning scales.⁶ Other studies conducted in Asia and Africa have reported reduced quality of life associated with both objectively assessed and subjectively reported impairment of vision.^{7 8 9 10}

In spite of considerable interest among researchers in the association of impairment of vision with reduced quality of life, substantial gaps remain in existing knowledge. For example, very few population studies have examined the impact of near vision impairment on the quality of life of elderly persons. These include, a report from McDonnell and colleagues in the United States.²⁵ The study from Tanzania, although the first from Africa, was limited to functional vision impairment using activities of daily living as a measure of quality of life^{9,10}. Another study from Mali did not consider near vision separately and was limited to a sample of 203 rural dwellers only⁸.

Elderly persons with impaired visual acuity may also have a range of other health concerns with potential effect on their quality of life. For, example just as old age may predispose to impaired vision so may it make the presence of chronic medical conditions and chronic pains more likely. These other health concerns are also likely to be associated with reduced quality of life in the elderly. In determining the effect of impaired vision on quality of life therefore, it is important to take account of co-occurring health conditions.

To our knowledge, no study has comprehensively examined the impact of impaired vision on quality of life in community dwelling African elderly persons, with determination of level of decrements attributable to distant or near visual impairments separately on diverse domains of quality of life. Given the fact that quality of life is determined by an individual's subjective experience and the possible effect of social and cultural factors on that experience, it is difficult to extrapolate the findings of the relationship between impaired vision and quality of life derived in one culture to another.

Method

A full description of the methods has been provided elsewhere^{11,12}. In brief, the Ibadan Survey of Aging (ISA) is a community based survey of the mental and physical health status as well as the functioning and disability of elderly persons (aged 65 years and over) residing in the Yoruba-speaking areas of Nigeria, consisting Lagos, Ogun, Osun, Oyo, Ondo, Ekiti, Kogi and Kwara states. These states account for about 22% of the Nigerian population (approximately, 25 million people). The survey was conducted between November 2003 and August 2004.

Respondents were selected using a multi-stage stratified area probability sampling of households. The stages consisted of local government areas as primary sampling units, the census enumeration areas as secondary sampling units, and the final sampling units being the households. In households with more than one eligible person (aged 65 years and fluent in the language of the study, Yoruba), the Kish table selection method was used to select one respondent¹³. The Kish method of selection ensures that differences in size of households do not constitute a bias in the selection process. After full information about the aims and objectives of the study and invitation to participate, respondents were those who provided consent, mostly verbal, either because of illiteracy or by choice, or signed, before interviews were conducted. Face-to face interviews were carried out on 2152 respondents who so

consented (response rate = 74.2%). Non-response was due to non-availability after repeated visits (14%), interviewers unable to trace the original address (4%), death (3%), and physical incapacitation (2%) and occasionally to refusal (2%).

The survey was approved by the University of Ibadan/University College Hospital, Ibadan Joint Ethical Review Board.

Measures

Vision was assessed with the use of self-report questions derived from the World Health Organization multi-country World Health Survey questionnaire¹⁴. Distant vision was assessed by asking respondents whether, in the past month and with the use of spectacles if they wore any, they had difficulty in seeing and recognizing somebody known to them across the road. For near vision, respondents were asked whether they had difficulty in seeing clearly or reading something held at an arm's length in the past month with the use of spectacles if they wore any. Possible responses were: no difficulty, some difficulty, and marked difficulty. In this report, persons with marked difficulty are classified as being visually impaired. These self reports were reliably made: analysis of test-retest assessment of 32 respondents conducted approximately one week apart gave a kappa value of 0.80 (s.e. 0.14) for distant vision and 1.0 (s.e. 0.00) for near vision.

Quality of Life—All respondents also completed the World Health Organization Quality of Life assessment instrument, WHOQOL-Bref. The WHOQOL-Bref was developed to be a cross-culturally applicable tool for the subjective evaluation of health-related quality of life¹⁵. Designed in diverse cultural settings, including one in Sub-Saharan Africa¹⁶, it has been shown to be a valid measure of quality of life in the elderly¹⁷. In the current sample, it has an excellent internal reliability (Cronbach alpha = 0.86). The WHOQoL-Bref allows the assessment of quality of life in four domains: physical, psychological, social and environmental. In view of widespread illiteracy among the respondents, the WHOQoL-Bref was administered by trained interviewers.

Self-reported chronic medical and pain conditions were also assessed in the ISA. Respondents were asked if they had any chronic respiratory conditions, digestive conditions, cardiovascular, cancer, diabetes, or epilepsy. The pain conditions assessed included back or neck pain, chest pains, joint pains, frequent headaches, and a general category of persistent pain in any other body parts. Respondents were asked whether they had experienced each of these conditions in the previous 12 months. Responses were coded “yes” or “no”. In the analysis herein presented, two items were produced from the responses to these questions: any chronic medical condition and any chronic pain condition. Respondents were dichotomized to those with a report of any chronic medical condition in the prior 12 months versus those with no such condition; those with a report of any chronic pain problem in the prior 12 months versus those with no chronic pain.

All the instruments were translated using iterative back-translation method to ensure that particular attention was paid to the cultural applicability of the terms and concepts in the interview schedules.

Data analysis

In order to take account of the stratified multistage sampling procedure and the associated clustering, weights have been derived and applied to the proportions reported in this paper. The weights took account of the probability of selection as well as non-response. Also, post-stratification to the target sex and age range were made to adjust for differences between the sample and the total Nigerian population (according to 2000 United Nations projections).

The weight so derived was normalized to reset the sum of weights back to the original sample size of 2152.

We assessed the association of self-reported vision impairment with the domains of quality of life using linear regression.¹⁸ The total possible score in each domain was converted to 100. We then computed the percent score of persons with and without vision impairment in each domain. For near vision impairment, we produced the adjusted mean difference between the two groups as representing the decrement in quality of life due to the effect of impairment of near vision, after controlling for age, sex, self-reported chronic medical conditions, chronic pain conditions, and for distant vision impairment. We repeated the analysis for distant vision after controlling for near vision as well as age, sex, chronic pains, and chronic medical condition. Finally, the analysis was conducted for impairment of both near and distant vision. The analysis was repeated for the physical, psychological, social, and environmental domains as well as overall quality of life as assessed by the WHOQOL. The analysis has taken account of the complex sample design and weighting. Thus, we used the jackknife replication method implemented with the STATA statistical package to estimate standard errors for proportions and coefficients.¹⁹

Results

A total of 2054 (95.5%) subjects out of the original sample size of 2152 answered the questions relating to vision. The weighted proportions were 52.5% males, and 47.5% females in the entire sample. The mean age was 75.0 \pm 9.2 years. Thirty four percent lived in rural dwelling, while the remainder lived in urban or semi urban dwellings. The proportion of respondents who reported distant visual impairment was 22.3%, 18.45% reported near visual impairment while 15.2% reported both distant and near visual impairment. Urban dwellers were more likely to report vision impairment ($P < 0.001$), but effect of residence on reporting distant rather than near vision impairment was only significant for semi-urban residence only ($P = 0.01$). Table 1.

Table 2 presents the results of the analysis of impact of distant vision impairment on quality of life. On the WHOQoL-Bref, persons with no distant vision impairment had 76.6% of the possible total score on the physical domain of quality of life.

The score of those with distant vision impairment was 71.17%. Thus, an unadjusted decrement in quality of life of 5.45% was observed. However, when account was taken of the age, sex, self-reported chronic physical condition, chronic pain and near vision status of the respondents, a non-significant decrement of 0.32% was obtained between those with and those without distant vision impairment. Only environmental domain with quality of life decrement of 2.37% ($p = 0.02$) between persons having distant vision impairment and those with out was statistically significant Table 3 shows the results in regard to near vision.

Persons with no impairment of near vision had 77.4% of the possible total score on the physical domain of the WHOQoL-Bref. Those with impairment of near vision had 68.7% score on this domain, giving an unadjusted decrement in quality of life of 8.73%. When adjustment was made for effect of possible confounding the decrement between the two groups was reduced to 6.95%, which nevertheless remained statistically significant. The adjusted decrement in quality of life between those with and those without near vision impairment was 3.09% for psychological domain, 3.88% for social domain, and 1.93% for environmental domain.

Table 4 provides the results in regard to impairment in both near and distant vision.

Here, the last column shows results of decrement in quality of life after adjustment has been made for age, sex, self-reported chronic physical condition, and chronic pain. The range of the decrements on the domains is narrow, being between 4.19% and 5.27%, suggesting that persons with impairments in both near and distant visions are liable to having more widespread decrement in their quality of life.

Discussion

In this report, we have presented findings from a large community sample of elderly persons aged 65 years and over in which the impact of visual impairment on quality of life was quantitatively assessed. Before discussing the main findings, we wish to draw the reader's attention to a number of caveats of our study. Our findings are based on self-reports of both visual impairment and of quality of life. It was not possible to objectively measure the level of visual impairment of the respondents by virtue of the study design. However self reports of visual impairment is an acceptable and useful way of determining visual acuity in epidemiological surveys and has been found to correlate well with objective measures of visual acuity in previous studies. 20,21,22 Analysis of test-retest assessment of self reports of the respondents showed that they were reliably made. Quality of life was measured by self-report, using a generic rather than a vision-specific tool. However, the tool we have chosen has particular utility in a population in which studies of quality of life have been rarely conducted. The WHOQoL-Bref is a tool designed for use across diverse cultures and has been shown to be a valid measure of quality of life in the elderly. 15-17 By allowing assessment to be made in four life domains, the instrument provides an opportunity to examine the specific impacts of visual impairment in these areas. Also, subjective reports of quality of life allows the assessment of the impact of health conditions on the respondents that is not tainted by the assessors' bias. Nevertheless, it is possible that the strength of association between visual impairment and quality of life may have been spuriously elevated in this sample because both measures were obtained by self reports. A strength of our report is that we have gone beyond previous reports examining the relationship between impact of visual impairment on quality of life by providing data on near, distant, and combined vision impairments and have examined four domains of quality of life assessed using a tool designed for cross-cultural application.

We found substantial and significant decrement in quality of life after adjusting for the possible effect of age, sex and co-occurring self-reported medical condition and functional disability. While the effect of distance visual impairment was limited to quality of life in the environmental domain, that of near visual impairment was all encompassing, with significant reductions in the physical, psychological, social as well as environmental domains, and accounting for 3.92% reduction in the overall quality of life of elderly persons in this sample.

Many studies have shown that visual impairment reduces the quality of life^{2,3, 23,24} but few studies have looked specifically at the impact of presbyopia and shown that near vision impairment had a more marked impact on the quality of life of elderly people. A study from the United States of America by McDonnell et al found an association of presbyopia with reduced quality of life. 25 A recent study from rural Tanzania also found a high prevalence of presbyopia as well as its substantial impact on activities of daily living as a measure of the quality of life, with severity of presbyopia having a dose response relationship with quality of life.⁹

More than half of our study population had no formal education yet near vision impairment had a significant impact on their quality of life suggesting, like the study from rural Tanzania did, a need to place greater importance on presbyopic correction among the elderly

population in developing countries. This observation runs contrary to the belief that presbyopic correction is only required by the educated for reading and writing. The reduction in quality of life scores for self reported distant visual impairment were only remarkable in the environmental domains which is not surprising since affected elderly persons would be less able to move about and socialise.

Conclusion

This study has found a substantial decrement in the quality of life of persons with self reported near visual impairment among this mostly uneducated elderly Nigerian population. The impact of self reported distance impairment was less significant. More studies are needed to further assess the impact of presbyopia as well as reliability and validity of self reporting tools in African settings.

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Table 1
socio-demographic characteristics of respondents

	N	Distant vision impairment	Near impairment	Both
Entire group	2054	22.3	18.4	15.2
<u>Gender</u>				
Female	976	20.9	15.3	13.1
Male	1078	19.3	18.3	12.1
<u>Age</u>				
65-69	676	14.9	16.1	10.1
70-74	469	17.8	14.4	10.7
75-79	285	25.6	19.8	16.6
80+	624	29.5	21.4	19.2
<u>Marital status</u>				
Currently married	1037	18.8	18.1	12.6
Separated, Divorced, or widowed	1017	21.9	15.3	13.2
<u>Residence</u>				
Urban	529	22.9	20.6	15.9
Semi-urban	826	20.1	15.2	11.3
Rural	699	17.4	16.7	12.4
<u>Years of education</u>				
0	1130	19.9	15.3	12.6
1-6	509	19.4	18.5	11.9
7-12	252	21.4	21.3	15.3
13+	163	19.5	16.9	13.4
<u>Income</u>				
Low	596	22.8	14.9	13.7
Low average	817	19.3	17.7	13.3
High average	538	19.0	17.2	11.5
High	103	18.6	20.1	14.1

Table 2
Effect of distant visual impairment on quality of life scores

WHO QOL Bref Domains	Persons with normal distant vision	distant visual impairment	% reduction QOL	% reduction QOL adjusted**
Physical	76.62	71.17	-5.45	-0.32(S.E=1.28)
Psychological	78.90	74.39	-4.51	-1.98(S.E=1.05)
Social	70.59	66.36	-4.23	-1.53(S.E=1.35)
Environmental	72.44	68.64	-3.80	-2.37(S.E=1.01) *
Total	74.41	69.49	-4.92	-1.41(S.E=0.94)

* P = 0.02

** Adjusted for age, sex, self-reported chronic physical conditions, chronic pain and near visual impairment

Table 3
Effect of near visual impairment on quality of life scores

WHO QOL Bref Domains	Persons with normal near vision	near visual impairment	% reduction QOL	% reduction QOL adjusted*
Physical	77.44	68.71	-8.73	-6.95(S.E=1.22) ;P=0.00
Psychological	79.19	73.99	-5.10	-3.09(S.E=1.00) ;P=0.00
Social	71.11	65.11	-6.0	-3.88(S.E=1.29) ;=0.0.00
Environmental	72.56	68.80	-3.76	-1.93(S.E=0.96) ;P=0.04
Total	74.93	68.75	-6.18	-3.92(S.E=0.87);P=0.00

* Adjusted for age, sex, self-reported chronic physical conditions, chronic pain and distant visual impairment

Table 4
Effect of combined distant and near visual impairment on quality of life scores

WHO QOL Bref Domains	Persons with normal vision	distant & near visual impairment	% reduction QOL	% red. QOL adjusted*
Physical	76.49	69.47	-7.02	-5.27(S.E=1.13)
Psychological	78.71	73.74	-4.97	-4.19(S.E=0.93)
Social	70.55	64.50	-6.05	-4.96(S.E=1.20)
Environmental	72.42	66.93	-5.49	-5.14(S.E=0.89)
Total	74.38	68.29	-6.09	-4.93(S.E=0.83)

* Adjusted for age, sex, self-reported chronic physical conditions, and chronic pain; P=0.00.