Rehabilitation for Independent Living: Challenges and Priorities of Visually Impaired Older People in Urban Nigeria

Okonji, P. E.[1] and Ogwezzy, D. C.[2]

1 Research and Innovation Office, University of Lagos, Akoka-Yaba, Lagos, Nigeria.
2 Delta State School of Health Technology, Ughelli, Delta State, Nigeria

Corresponding Author: Patrick Okonji | Email: opatrick@unilag.edu.ng | Phone: +2348149777036

Abstract

The specific objectives of this study is to determine aspects of self-reliance in daily life activities that are most challenging for adults with vision impairment and to determine what areas of rehabilitation should be the keystone of low vision care and/or rehabilitation for this group. Participants were recruited from Lagos and Delta state, Nigeria. A total of 128 visually impaired older adults aged 60 years and over took part in the study. A survey method; using questionnaires was employed in order to get data from respondents. Participants Visual Acuities were measured and using the Lawton Instrumental Activities of Daily Living (IADL) scale, participants responded to questions on daily living tasks they considered as challenging. The relation between self-reliance in daily tasks and years of vision impairment proved the presence of relationship in some activities such as being able to use the telephone ($\chi2=0.66$, $p=0.7196$), being able to plan, prepare and serve meals without help ($\chi2=4.13$, $p\leq0.1271$), and doing laundry without help ($\chi2=2.31$, $p=0.3155$). Other activities did not show such correlation. The results revealed that, with increasing years of visual impairment, participants were more likely to report that indoor tasks (such as doing laundry, doing household chores, and using the telephone) were easier than outdoor tasks (such as shopping, spending money independently, and travelling independently). The study concludes that rehabilitation for outdoor activities should be keystone of low vision care. Implications of this study for social inclusion of this group and for successful adjustment to difficulties posed by vision impairment are discussed.

Keywords: independence, vision, daily-living, impairment, rehabilitation

Introduction

The World Health Organisation (WHO) defines vision impairment as visual acuity of less than 6/18 and/or corresponding vision field loss to less than 10 degrees in the better eye with glasses or after medical or surgical treatment.[1] Of the current total world population of over 6.8 billion people, there are more than 800 million people aged 60 years and over[2]. Among this population group, approximately 1 in 12 persons is visually impaired and predictions indicate that this number will increase by 20% over the next 10 years especially in less developed countries.[2,3] This is mainly because people are living longer and ageing is associated with an increased risk of vision impairment.

Research suggests that visual impairment limits the capacity to perform one or more essential activities of daily life.[4] Visual impairment in elderly persons decreases

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independence and functional abilities.[5,6] Apart from vision impairment, ageing is often characterised by losses such as bereavement, retirement, children leaving home, which can adversely affect the social networks of older adults or their ability to maintain their independence. In line with these issues, interventions that can enhance the ability of older adults to maintain independence particularly with carrying out daily living tasks is becoming an on-going public health concern in today's ageing societies.[7,8]

In Nigeria as well as many developing countries, older visually impaired people often have fewer opportunities to make necessary adjustments required for independent living after the diagnosis of vision impairment due to inadequate facilities, resources, and access to rehabilitation systems.[9,10] There is paucity of data on rehabilitation priorities of visually impaired elderly in developing countries. The focus of this study, however, is to identify aspects of daily living tasks that are most challenging among older people with visual impairment. There is a need to clarify and deepen the understanding of the most common difficult activities of daily living as such knowledge could in turn inform understanding of issues of prime concern such as most important considerations for rehabilitation and training programs among this group.

Independent living, or the ability to take care of one's self, centres on the idea that the elderly and those with disabilities can have the ability to take care of themselves with very little, if any, need for help from others. In the face of adversity resulting from functional loss, older people maintain their health and well-being via psychosocial adjustments which define their resilience.[11] Difficulties with making adjustments to functional limitations caused by visual impairment can result in feelings of frustration at having to be overly reliant on support from others.[12] A visually impaired person who is unable to make necessary adjustments by adapting or compensating for such losses may go through psychological symptoms such as: anxiety, stress, and major depression which may ultimately affect their self-esteem.[13] With the right selection of training for independent living, older people with vision disabilities can perform everyday tasks and be self-reliant.

Many studies conducted in developed countries,[14-16] suggest that difficulty with reading (i.e. access to print materials) is the most commonly reported problem among people with low vision, regardless of the underlying cause of their vision loss. A low vision rehabilitation study of 819 patients seeking low vision services at 28 clinical centres in the United States between 2008 and 2011 showed that women were more likely to report difficulty with in-home activities, facial recognition and social interactions, whereas men were more likely to report mobility difficulties.[15] The study authors concluded that since difficulty with reading was the most common complaint, reading rehabilitation should be a cornerstone of low vision care. Other functional difficulties reported by participants in the United States study[15] included driving (27.8%), using magnifiers and other vision aids (17.5%), mobility (16.3%), performing normal in-home activities (15.1%), problems

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associated with lighting and glare (11.7%), and trouble recognizing faces and engaging socially (10.3%). Many studies on how vision impairment affects activities of daily living suggest that visually impaired older people do not only have challenges with carrying out their daily activities, but they are also faced with significant challenges in outdoor mobility.[17-20] Mobility restrictions associated with vision impairment were identified in an earlier study as a hindrance to participation in social activities and social engagements.[18] Some studies contend that the prevalence of loneliness and social isolation among visually impaired older adults is much higher than their sighted peers due to reduced mobility.[18-20]

There is paucity of information on rehabilitation needs of visually impaired older people living in developing countries despite increasing populations of older people with visual impairment – which is even growing faster than available funding and the availability of qualified rehabilitation personnel.[21,22] Funding for low vision rehabilitation services in developing countries is inadequate for specialized agencies and professionals to develop and deliver services to the geographically and culturally diverse population of older people with visual impairments. With limited resources, there is a need for the identification of specific rehabilitation services of priority or utmost importance, and informed decision about the rehabilitation therapy that should be targeted in specific vision impairments. This may reduce costs associated with providing unnecessary services. It is also possible to change stereotypes about vision impairment by promoting interventions that could enhance independent living among people with vision impairment. Negative attitudes based on stereotypes about disabilities not only leads to restrictions on people with disabilities, but might further exclude them.[23,24] Ignorance about the skills and capacity of disabled people to live independently have been argued to be the greatest obstacle in preventing them from accessing opportunities available from within mainstream society and enjoying other aspects of social inclusion.[25, 26]

The goals of this study include adding to the body of knowledge that can be used by eye care rehabilitation professionals to promote independent living, and economic and social self-sufficiency among older people with vision impairment. This study could assist visually impaired persons to make informed choices, especially where resources for vision rehabilitation are limited, as there might be a need for prioritized choices in the type of training for independent living. The specific objectives of the study is to determine aspects of self-reliance in daily life activities that are most challenging for adults with vision impairment and to determine what areas of rehabilitation should be the keystone of low vision care and/or rehabilitation for this group.

Materials and Methods

The study design employed for this study was survey method using questionnaires. A purposive sampling technique was used to select participants (visually impaired older adults) eligible to participate in the study. As the exact population size of visually impaired older adults in Lagos and Delta states were unknown, the authors employed a 'non-finite approach'[27] for the determination of sample size; given as: $n = Z^2\sigma^2 / E^2$.

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Where Z = standard score at a specified confidence interval, i.e. 1.65 for 0.95 Confidence Interval (CI); σ = estimated population standard deviation; and E = σ / sqrt(n). Under this non-finite sample size calculation, the minimum sample size is n=30.[27]

A total of 128 visually impaired older people recruited from 14 private eye clinics in Delta-state and Lagos state, Nigeria were recruited for the study. The private clinics were randomly selected from 5 local government areas in Delta state and 9 local governments in Lagos state. The criteria for inclusion in the sample include visually impaired adults aged 60 years and over, fluency in English, binocular corrected visual acuity < 6/18 (LogMAR < 0.5), and not less than 1 year since the diagnosis or onset of vision impairment. Medical exclusions included presence of a serious medical illness, a recent head injury or stroke (less than 6 months prior to testing), hearing loss, dementia, Parkinson's disease, psychiatric diagnosis, or ongoing dependence on alcohol or other drugs that could impair daily functioning. Participants were briefed about the study and their verbal consent audio recorded before participation. Visual acuity (VA) of participants was measured using a Snellen chart. Best corrected monocular visual acuity was also recorded. The severity of visual impairment was determined by measuring binocular visual acuity and recording the equivalent LogMAR ratio of Snellen values using the International Council of Ophthalmology conversion chart (mild vision impairment ≤ 0.5, moderate = 0.6 – 1.0, severe vision impairment = 1.5 – 1.9, blindness ≥ 1.9).[28] Binocular VA was used because the evaluation of visual function for activities of daily living that are strongly associated with use of both eyes, is best conducted via binocular acuity testing.[29] Consecutive consenting respondents visiting the registered private clinics in the two states were recruited for the study. A structured interview questionnaire to ascertain socio-demographic details of participants was read out to participants and their responses recorded. Interview questionnaire consisted questions on age, gender, educational level (low, medium, or high), and household composition (single or living with others). We categorized individuals with Secondary School Certificates, General certificate of Education (GCE), or Ordinary National Diplomas (OND) as Low levels of education, and participants with Higher National Diploma (HND) or a University Bachelor's Degree as Medium level education. Respondents with a Master's degree or a Doctorate degree were classified as High education levels. These classifications were based on the International Standard Classification of Education (ISCED-97) that provided guidance to countries within Organisation for Economic Cooperation and Development (OECD) on how to implement ISCED-97 framework in international data collection.[30] Enquiries were also made concerning the number of years that each participant has lived with vision impairment, and existing medical conditions. The Lawton scale (IADL) was used to evaluate self-reliance and ability to conduct activities of daily living independently. Each thematic question on the Lawton IADL scale was addressed as one question. Participants were required to answer yes (score =1) or no (score=0) to each question. The activities assessed include: use of telephone, shopping, food preparation, house-keeping, self-care, mobility/independent travelling, and handling finances. Analysis (Chi-square test, Mann - Whitney test, and Kruskall - Wallis test) was conducted using IBM SPSS (2015) and significance level was accepted at the value $p<0.05$. T-test was employed to examine Lawton IADL score differences between genders.

RESULTS

A total of 76 females (59.38%) and 52 males (40.62%) participated in the study (Table 1). Respondents were aged between 60 and 89 years (Mean = 71.60 years, 95% Confidence Interval of the mean= 70.25 – 72.94; SD = 7.68 years). A majority of the respondents had either low or medium level education (61 (47.66%) and 39 (30.46%) respectively). Only 28 participants

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(21.88%) had high level of education. Many of the respondents (n= 113; 88.28%) lived with their families and admitted having access to family care and support. The mean LogMAR visual acuity was 1.06 (SD=0.51, 95% CI: 0.06-2.06). Visual acuity (VA) result indicated that 39 participants (30.47%) were blind (LogMAR VA: ≥ 1.9), 26 respondents (20.31%) were severely vision impaired (LogMAR VA: 1.1 - 1.4), 29 of them (22.65%) had moderate vision impairment (LogMAR VA: 0.6 – 1.0), and 34 respondents (26.57%) had mild vision impairment (LogMAR VA: 0.5 – 0.59). The average number of years of onset of vision impairment was 5.56 years (SD= 4.41, 95% CI= -3.08 – 14.21). Participants, however, reported suffering from other diseases, namely; hypertension (n= 37; 28.90%), diabetes (n=28, 21.88%), osteoarthritis (n=14; 10.94%), and prostate enlargement (n=10; 7.81%). Only 2 participants (1.56%) used wheelchairs and 13 participants (10.16%) used a walking stick.

The result of the Lawton scale (IADL) ranged between 3 and 17 points (Mean [M] = 8.23; SD= 3.32). None of the respondents was totally independent in all assessed activities of daily living. As shown in Table 2, a majority of participants reported difficulties with shopping without help: 53 (41.41%), preparing and serving meals without help: 61 (47.66%), doing house chores: 54 (42.19%), and doing laundry without help: 53 (41.41%). Similarly, other activities more frequently mentioned as impossible to perform independently included dispensing medications independently: 77 (60.16%), managing finances: 68 (53.13%), travelling independently on public transport: 77 (60.16%), and using the telephone: 67 (52.34%). The results on the Lawton scale did not reveal any significant statistical differences between genders (t= -0.3226, p=0.3737, not significant at $p<0.05$) when considering independence in activities of daily living explored. The relationship between education levels and scores on Lawton scale revealed a positive correlation between level of education and scores ($r = +2.1036$, $p \leq 0.0000$) – the more educated respondents had higher scores. An inversely proportional correlation was also observed between severity of vision impairment and self-reliance in activities of daily living ($r= -0.5945$, $p = 0.0000$). A stronger independence was reported among participants with less severity of vision impairment ($\chi^2 = 58.61$; $p = 0.0000$) (Table 3). Analysis of the relationship between self-reliance in daily tasks and years of visual impairment showed the presence of relationship with some activities such as being able to use the telephone ($\chi^2 = 0.66$, $p = 0.7196$), being able to plan, prepare and serve meals without help ($\chi^2 = 4.13$, $p = 0.1271$), and doing laundry without help ($\chi^2 = 2.31$, $p = 0.3155$). Other activities did not show such correlation (Table 4).

Discussion

This study set out to investigate the most common difficult activities of daily living among visually impaired people in order to provide an understanding of the aspects that the generic rehabilitation training programs for independent living among this group should prioritise. Many elderly persons value their sense of independence, self-reliance and self-sufficiency.[6,19] While vision impairment is associated with challenges of maintaining independence, particularly with daily tasks, findings from this study suggests that the most difficult daily-living-tasks for the participants included shopping without help, travelling independently, managing financial matters without help, and dispensing medications without the support of other people. These findings point out areas deserving attention as they highlight aspects that should be addressed not only for interventions to promote independent living but also for social inclusion for visually impaired persons in society. Firstly, given that traditional design retail shopping environments in many parts of the country focus primarily on mainstream market, with little attention to the needs of the visually impaired customers, retail shopping demands significant effort at every step of the shopping process for people with vision impairment, including getting

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into the store; distinguishing colours, judging product quality; reading labels, receipts or store signage with tiny prints; negotiating store layout and dealing with store lighting; and interacting with sales associates.

Secondly, findings echo conclusions from previous studies that mobility is fundamental to independence[31,32]. Participants reported limited capacity to travelling independently, and such reports emphasize the importance for mobility training among this group. Mobility restrictions associated with vision impairment were identified in earlier studies[17,18] as a hindrance to social inclusion due to lack of confidence, fear of falls, fear of getting lost, fear of hidden dangers or obstacles, and feelings of vulnerability.[20,33] It is possible that, for this group, the big fear of travelling independently could be compounded by mobility challenges and transport safety associated with people living with disabilities in Nigeria. Such challenges include, but are not limited to, lack of accessible transport infrastructure that do not meet the needs of the blind, poorly illuminated walkways ridden with potholes, elevated floor vehicles, and lack of disability awareness training for public transport staff.[34]

Findings from this study also show that managing financial matters and making cash payments is a significant issue for this group. As computer automated systems are now in use for financial services that were previously delivered in person, there are evidences indicating that people living with vision impairment are more likely to experience economic and social disadvantage and are more at risk of poverty than those without disability.[35,36] In Nigeria, common recognisable barriers which complicate difficulties experienced by people with vision impairment to manage money and get equal access to technology-enhanced banking include a lack of user friendly online interface that are inaccessible with a screen reader, widespread use of Automatic Teller Machines (ATMs) that cannot be operated using speech, ATMs without head phone jacks to listen to audio instructions, unavailability of braille embossed debit cards, lack of audio enhanced security dongles for online transactions, ATM screen with poor contrast and fonts, etc. With the dearth of assistive technologies that can help identify currency notes and other inclusive infrastructure, adults with vision impairment are more likely to depend on family, friends or third parties to access and manage their finances and are arguably less likely to register for online or mobile telephone banking due to the difficulties associated with the computer mediated user interfaces.

The study also showed that dispensing medications without help still remains challenging for many visually impaired older persons. This is consistent with previous findings that most visually impaired adults face difficulties in handling their medication[37] and more specifically, reading medication labels, recognising expired medications, administering eye drops, and measuring liquid doses are difficult tasks for this group.[38,39]

In Nigeria as well as many developing countries, pharmaceutical companies rarely include medication name in Braille on the drug package. A previous study identified difficulty with handling medication as one of the major reasons for drug non-compliance among many visually impaired persons in Nigeria.[40]

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A cursory look at the findings from this study suggests that, apart from dispensing medications, the visually impaired participants were more likely to cope with indoor daily living tasks (i.e. using the telephone, preparing and serving meals, doing household chores, and doing laundry) than outdoor tasks (i.e. shopping, travelling independently, and spending money). It is possible that, with increasing years of living with sight loss, visually impaired persons are more likely to have learnt to develop coping mechanisms for home-based activities of their daily lives and lead independent lives.[41] While home-based tasks and indoor environment can be organised or modified to enable a visually impaired person make adjustments, adapt, and cope with challenges of daily living, the outdoor environment is, to a large extent, beyond the modification capacity of any individual. It is therefore imperative for government to make public places and facilities accessible for people with vision impairment as this will not only promote their inclusion into society but also enhance their successful adaptation to daily-life challenges posed by vision impairment.

The study findings should be taken with caution due to the small sample size. While, environmental and societal factors play a crucial role in the adjustment process and impact on self-reliance abilities, personal factors also play an important part in the adjustment process. This study did not investigate the scope of personal factors that could have influenced participants' responses on daily tasks they regarded as difficult or easy. In addition, the list of possible challenges with activities of daily living culled from Lawton scale is not exhaustive of the spectrum of difficulties with daily tasks. Again, a majority of the participants were old (60 years and over) and may not reflect problems faced by younger patients.

Conclusion

All aspects of rehabilitation and intervention to support self-reliance among older people with vision impairment are important. Adjustment to and coping with vision impairment is a vital element of well-being because adjusting to one's environment, which it entails, can foster self-reliance, and the development of healthy self-esteem.[42] As shown in the findings of this study, there is a need for improved access to public places and facilities for this group as a majority of the daily living tasks that they found most-challenging were associated with participation in public domains. Cost effective interventions to promote successful adaptation to vision impairment and self-reliance may therefore focus on more inclusive facilities for shopping, banking or managing money, travelling, as well as handling medications. This will be cost effective because government's single investment in vision-disability-inclusive facilities will enable the large numbers of people living with vision disabilities to participate actively in society and adapt positively to challenges of vision impairment. This kind of approach is a one-size-fits-all sustainable approach and not an individualistic approach which could be more expensive. The government, commercial institutions, travel and transport companies, and pharmaceutical companies must work in collaboration to address the special needs of the visually impaired. Rehabilitation professionals for independent living should focus more on the identified aspects and also champion advocacy for an inclusive society – as a potential avenue for independent living among this group.

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Table 1.
Demographic characteristics of participants

	N	%
Gender		
Male	52	40.62
Female	76	59.38
Age		
60- 70	54	42.19
71 - 80	60	46.89
80+	14	10.92
Education Level		
High	28	21.88
Medium	39	30.46
Low	61	47.66
Vision impairment (Based on LogMAR Vision Acuity)		
Mild (LogMAR VA: 0.5-0.59)	34	26.57
Moderate (LogMAR VA: 0.6-1.0)	29	22.65
Severe (LogMAR VA: 1.1 – 1.4)	26	20.31
Blind (LogMAR VA ≥ 1.5)	39	30.47
Household composition		
Single	15	11.72
Living with others	113	88.28

Table 2.
Participants' responses to activities of daily life

No	Content of Questionnaire	Responses (n, %) Yes	No
1	Are you able to use the telephone independently?	61(47.66)	67(52.34)
2	Can you do your shopping without help?	75(58.59)	53(41.41)
3	Are you able to plan, prepare, and serve your meals without help?	67(52.34)	61(47.66)
4	Can you do your house chores without assistance?	74(57.81)	54(42.19)
5	Can you do your laundry without help?	75(58.59)	53(41.41)
6	Can you travel independently on public transportation?	51(39.84)	77(60.16)
7	Can you manage your financial matters and make cash payments without help?	60(46.87)	68(53.13)
8	Are you able to dispense your medications independently?	51(39.84)	77(60.16)

Table 3.
Severity of vision impairment in connection with Self-reliance among participants

No	Content of Questionnaire	Severity of Vision impairment	Self-reliance		X^2 p<0.05
			Yes	No	
1	Are you able to use the telephone independently?	Mild (n= 34)	31	3	59.57 < .0001
		Moderate (n=29)	19	10	
		Severe (n=26)	9	17	
		Blind (n= 39)	2	37	
2	Can you do your shopping without help?	Mild (n= 34)	34	0	73.58 < 0.0001
		Moderate (n=29)	26	3	
		Severe (n=26)	10	16	
		Blind (n= 39)	5	34	
3	Are you able to plan, prepare, and serve your meals without help?	Mild (n= 34)	29	5	34.67 < 0.0001
		Moderate (n=29)	20	9	
		Severe (n=26)	9	17	
		Blind (n= 39)	9	30	
4	Can you do your house chores without assistance?	Mild (n= 34)	30	4	36.78 < 0.0001
		Moderate (n=29)	20	9	
		Severe (n=26)	16	10	
		Blind (n= 39)	8	31	
5	Can you do your laundry without help?	Mild (n= 34)	34	0	73.58 < 0.0001
		Moderate (n=29)	26	3	
		Severe (n=26)	10	16	
		Blind (n= 39)	5	34	
6	Can you travel independently on public transportation?	Mild (n= 34)	24	10	33.96 < 0.0001
		Moderate (n=29)	16	13	
		Severe (n=26)	8	18	
		Blind (n= 39)	3	36	
7	Can you manage your financial matters and make cash payments without help?	Mild (n= 34)	32	2	67.98 < 0.0001
		Moderate (n=29)	19	10	
		Severe (n=26)	8	18	
		Blind (n= 39)	1	38	
8	Are you able to dispense your medications independently?	Mild (n= 34)	29	5	61.03 < 0.0001
		Moderate (n=29)	16	13	
		Severe (n=26)	6	20	
		Blind (n= 39)	0	39	

Table 4. Years of vision impairment in correlation with self-reliance of respondents

No	Content of Questionnaire	Years of Vision impairment	Self-reliance Yes	Self-reliance No	X^2 P (P<0.05)
1	Are you able to use the telephone independently?	1-5 (n=62)	36	26	
		5-10 (n=42)	21	21	0.66 0.7196
		10+ (n=24)	12	10	
2	Can you do your shopping without help?	1-5 (n=62)	48	14	
		5-10 (n=42)	25	17	10.48 0.0005
		10+ (n=24)	10	14	
3	Are you able to plan, prepare, and serve your meals without help?	1-5 (n=62)	40	22	
		5-10 (n=42)	19	23	4.13 0.1271
		10+ (n=24)	12	12	
4	Can you do your house chores without assistance?	1-5 (n=62)	40	22	
		5-10 (n=42)	14	28	10.10 0.0060
		10+ (n=24)	14	10	
5	Can you do your laundry without help?	1-5 (n=62)	36	30	
		5-10 (n=42)	23	19	2.31 0.3155
		10+ (n=24)	9	15	
6	Can you travel independently on public transportation?	1-5 (n=62)	49	13	
		5-10 (n=42)	26	16	11.40 0.0335
		10+ (n=24)	10	14	
7	Can you manage your financial matters and make cash payments without help?	1-5 (n=62)	41	21	
		5-10 (n=42)	13	29	22.28 < 0.0001
		10+ (n=24)	4	20	
8	Are you able to dispense your medications independently?	1-5 (n=62)	39	23	
		5-10 (n=42)	18	24	7.62 0.0221
		10+ (n=24)	8	16	