

## Research Article

### Factors Affecting Uptake of Orientation and Mobility Rehabilitation Training among Blind Older People in Nigeria

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#### Abstract

**Purpose:** The study investigated the factors affecting the low uptake of Orientation and Mobility Rehabilitation Training (O&M RT) among 350 legally blind ( $VA \leq \text{LogMAR} -1.00$  and/or visual field loss to less than  $10^\circ$ ) older adults aged  $\geq 60$  years who had never gone for O&M RT.

**Methods:** Key variables for non-uptake of O&M RT, and dichotomous independent variables investigating the different aspects of self-developed coping strategies were analyzed using a hierarchical logistic regression model.

**Results:** Having a visual acuity less than  $\text{LogMAR} -1.40$  was significantly related to asking for help with mobility ( $p < 0.001$ ). Forty-five participants (12.86%) indicated that they limited their mobility to only familiar places. Those who were 75+ years ( $p < 0.01$ ) and had been blind for 10+ years ( $p < 0.01$ ) were more likely to restrict their movement than participants who had been blind for less than 10 years, and also more likely to not see any need for or be interested in taking up O&M RT.

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**Conclusion:** The duration of visual impairment influenced decisions to take O&M RT, as participants who were blind for longer periods (10+ years) were more likely to be disinterested in seeking O&M RT. Implications of findings for prompt referrals for O&M RT are discussed.

**Keywords:** Blindness; Disability; Older people; Orientation and Mobility; Rehabilitation

#### Introduction

The World Health Organization (WHO) estimates that, globally, 2.2 billion people have low vision or blindness [1]. Legal blindness is defined as visual acuity of less than 20/200 ( $\text{LogMAR} -1.00$ ), or a corresponding visual field loss to less than  $10^\circ$ , in the better eye with the best possible correction [2]. In many countries, legal blindness is the benchmark to determine eligibility for rehabilitation, vocational training, Orientation and Mobility Rehabilitation Training (O&M RT), and disability benefits. Visual impairment refers to both low vision and blindness. The majority of people with visual impairment are in developing countries and aged 50 years and over [1]. In Nigeria, the last national visual impairment survey, albeit dated, estimated that more than 4 million adults were visually impaired [3]. For many Blind and Visually Impaired (BVI) individuals, getting outdoors and around safely is a source of anxiety as BVIs often struggle with independent travels especially when it involves physical trips to unfamiliar places.

Effective skills of Orientation and Mobility (O & M) which demands reliance on visual acuity is usually required for independent travels in the environment. Essentially, BVI individuals can compensate for reduced vision and maintain travel independence by learning O & M skills [4,5]. While orientation is the ability to recognize and establish position in relation to the environment, mobility refers to the ability for physical movement in an orderly, efficient and safe manner [6]. BVI persons can negotiate and ambulate the environment safely and independently through O & M Rehabilitation Training (O&M RT) [7,8] as the scope of the training allows them to learn how to best enhance their mobility performance using their residual vision and other senses, such as touch and hearing [9]. O&M RT also teaches useful strategies enabling BVIs to supplement the senses with adequate use of devices such as support canes [10]. This skills-set of rehabilitation services are mainly provided by specially trained professionals - Certified Orientation and Mobility Specialists (COMS) who teach skills for independent travels, including the use of long white canes, public transportation, electronic travel devices, soliciting and/or declining assistance, protective techniques for safe mobility, and human or sighted guide. Others include skills for finding destinations by employing strategies for following directions and using landmarks, developing techniques for analyzing and crossing streets, understanding traffic patterns, and problem-solving skills to make safe decisions when lost or when there is a need to change route.

There is consensus in the existing literature that mobility is an important activity of everyday life, and that impaired mobility significantly affects well-being and quality of life [11,12]. However, the

provision and uptake of O&M Rehabilitation Training (O&M RT) continues to be relatively low particularly in developing countries [13]. This study aimed to investigate barriers to the uptake of O&M RT among BVI older adults in Nigeria to create an understanding of how BVI older adults can be encouraged and/or supported to seek O&M RT. The research question explores critical factors acting as barriers to accessing O&M RT and attempts to provide explanations on associated key factors for low uptake of O&M RT. This is particularly a significant concern; considering that Nigeria is one of the sub-Saharan African countries with a high incidence and prevalence of blindness, and among countries with the poorest availability and access to vision rehabilitation services [14].

## Background

The challenge of providing vision rehabilitation services for the growing population of blind and visually impaired people in Nigeria is increasing and efforts to foster support for their well-being must focus on addressing problems that are associated with day-to-day challenges of living with visual impairment, such as mobility. Research has shown that many visually impaired individuals avoid outdoor activities and restrict their movements, tending to prefer known environments due to poor O & M skills and fear of falls [15,16]. There are shreds of evidence that effective O&M RT prevents falls among BVI individuals, reduces the fear of falling [7,17], and enhances successful adjustment to challenges of living with visual impairment [15]. Falls and fear of falling have a significant negative impact on the social lives of BVI persons in that, many BVI individuals either reduce their activity so that they are much less active than they used to be or stop going out altogether. People living with visual disabilities can take O&M RT on a one-to-one basis, or at a rehabilitation center (called “center-based O&M”) or in the community where they reside and/or work (called “itinerant O&M”). Not many such centers exist in Nigeria due to the scarcity of Certified O&M Rehabilitation Specialists (COMS). While there is a paucity of research exploring access to and barriers to seeking O&M RT in Nigeria and many developing countries due to the dearth of O&M professionals, some studies conducted in developed countries have found that anxiety, fears, and stress were major reasons for non-acceptance of O&M training among BVI [18,19]. There is evidence that some BVI individuals believe that the acceptance of O&M RT would enunciate their disability and reveal their vulnerability [19].

In many parts of Nigeria, mobility remains a huge challenge for many BVIs due to inadequacies in social infrastructure for mobility as well as policy gaps for disability inclusiveness. As an example, there is a remarkable lack of inclusive means of transportation that caters to the needs of blind people as the mainstream public transportation facilities are often not accessible for individuals living with vision disabilities [20,21]. For many BVI individuals in Nigeria, some common problems with using public transport relate to difficulties encountered when trying to locate entry points, as well as the major problem of safety. Also, the absence of consistent footpaths makes mobility extremely difficult. Although there is no legislation for or against the use of guide dogs in Nigeria, their use is rare due to the predominance of a culture of aversion to traveling with dogs in public transportation. Often, users of guide dogs are denied access to public buses and/or taxi services due to public perception of dogs as menacing; especially to unfamiliar faces and their perceived risks to safety. Nevertheless, training for effective strategies to enhance the development of independence in movement is important as the lack of mobility has social

and economic consequences. In economic terms, people with visual disabilities are lost to the workforce and will be unable to contribute to the national economy. In social terms, ill health and poverty associated with disability are likely to affect the quality of life of BVIs as well as their entire family and society. According to World Bank [22] estimates, disability accounts for gross domestic product losses ranging between 15 and 40% in low-income countries.

There is a severe shortage of COMS in Nigeria. On the one hand, the shortages of COMS may be responsible for the low uptake of O&M RT. On the other hand, it could be argued that the low demand for O&M RT has led to workforce shortages in this field of profession. However, there is little or no empirical evidence in the literature to support these conjectures. If anything, detailed surveys in some rural communities in Nigeria have found very low uptake of public health-care facilities despite being within geographic proximity and free of any out-of-pocket charges [23]. There has not been any study investigating O&M-seeking behaviors of people with visual impairment in Nigeria, or exploring obstacles to O&M RT among individuals with sight loss to not only understand the challenges of poor uptake of the training from the perspective of BVI persons but also to inform policy and practice. To bridge this knowledge gap, this study explored the following research questions:

- What factors account for the barriers to uptake of orientation and mobility training among legally blind older adults?
- What relationship exists between self-coping strategies for mobility, and decisions affecting uptake of orientation and mobility training?

Understanding factors affecting uptake of O&M RT could improve knowledge and how to best tailor access to the training and encourage both professional referrals of BVI individuals for the training as well as BVI people’s responsiveness to seeking O&M RT, and the need to train more professionals in the field of orientation and mobility rehabilitation.

## Ethics

The study adhered to the ethical tenets of the Helsinki Declaration (1975) and as revised in Tokyo (2004) which outlines global best guidelines for the conduct of research with human subjects. Ethical approval was sought and obtained from the Research and Ethics Committee of the School of Health. Participation was voluntary and verbal consent was obtained from all participants before recruitment into the study. Participants were reassured of anonymity and confidentiality.

## Methods

The study employed a cross-sectional survey method. Participants were recruited during their routine eye clinic visits in 25 registered eye clinics in six states, namely: Lagos state, Edo State, Ogun State, Kwara State, Rivers State, and Delta state in Nigeria between February 2018 and September 2020. Participants were aged 60 years and over. Also, the snowball sampling technique [24] was employed to gather more participants in all the counties. Eligibility criteria for the study included having severe visual impairment of 20/200 (LogMAR -1.00) or less, and/or a visual field of 20 degrees or less in the better eye with the best-corrected visual acuity [25], yet to participate (non-uptake) in any O&M RT and having the ability to read and converse in English. A total of 468 visually impaired persons were con

tacted from the private and government eye clinics in the six states but 98 declined to participate. Twenty participants could neither understand nor speak English Language and as the study had not recruited a language translator, these participants who could not communicate in English were excluded. A total of 350 participants took part in the study (i.e. a response rate of 74%).

The eye clinics were randomly selected from Six Local Government Areas (LGAs) in Delta state, five LGAs in Edo state, Ogun state, Rivers State, Kwara State and nine LGAs in Lagos state. Data were typically gathered through surveys of participants' opinions as well as previous clinical records of participants' visual health care, through Optometrists providing them with care in the respective clinics. A structured questionnaire to ascertain the socio-demographic details of participants was read out to them and their responses were recorded. Questionnaires were read aloud for participants and their responses were recorded. Demographic details recorded included: Age, gender, educational level, and household composition. A computerized Snellen chart was used to assess the level of vision of each participant and corresponding LogMAR values of the Snellen ratio were recorded. The survey questions investigated how much the participants depended on others to move about; particularly for outdoor mobility tasks (also referred hereafter as dependent mobility). Appropriate boxes corresponding to participants' responses were checked (marked) on the questionnaires.

**Measures:** Age, gender, education, household composition, and visual acuity were treated as independent variables. Dichotomous independent variables to investigate the different aspects of self-developed coping strategies were "Already using a walking aid" (such as a walking stick not prescribed or recommended by an orientation and mobility trainer), "Limiting mobility to only familiar places" and "Soliciting for help with mobility". The questions on "Already using a walking aid" and "Limiting mobility to only familiar places" allowed respondents to answer with "yes" or "no". Yes was coded as 1 and no = 0. Sample questions on relying on others for help with mobility included, "I have difficulties with outdoor mobility, but I have someone (or ask anyone around me) to guide me", "I restrict my movement to only familiar paths", "I'm okay using only my senses and remaining vision to get around". These questions on asking others for help with moving around allowed respondents to answer on a 4-point scale: 1 (strongly agree), 2 (agree), 3 (disagree), and 4 (strongly disagree). All scores were aggregated and lower scores corresponded to higher levels of reliance on others to get around and reluctance to seek O&M RT. Mean (M) and Standard Deviation (SD) scores from the dichotomous dependent variables were "Already using a walking aid" (M = 0.45, SD = 0.30), "Soliciting for help with mobility" (M= 0.35, SD = 0.31) and "Limiting mobility to familiar places" (M = 0.51, SD = 0.26).

Dichotomous key variables of reasons for non-uptake of O&M RT were also analyzed as dependent variables. The variables examined included not having a perceived need or not interested in going for O&M RT (no need/interest), the assumption that it would be expensive to seek such specialized training (cost of O&M RT), stigma, and not knowing where to seek O&M RT (unaware of where to seek O&M RT). A Hierarchical logistic regression analysis was conducted using IBM SPSS statistics version 26. Two-step models were initially used to investigate the effects of gender, education, and household composition on vision acuity, but these variables did not affect the original model, so the table 1 below shows only the final regression analysis.

	N	%
<b>Gender</b>		
Male	144	41.14
Female	206	58.86
<b>Age</b>		
60-65	84	24.00
66-70	90	25.71
71-75	98	28.00
76+	78	22.29
<b>Education</b>		
Primary	163	46.57
Secondary	102	29.14
Post-secondary	85	24.29
<b>Visual Acuity (V.A)</b>		
LogMAR -1.00 to -1.30	152	43.43
LogMAR -1.31 to -1.40	120	34.29
LogMAR < -1.40	78	22.28
<b>Duration of Visual Impairment</b>		
0-5 years	147	42.00
6-10 years	126	36.00
10+ years	77	22.00
<b>Household Composition</b>		
Single	88	25.14
Living with others	262	74.86

**Table 1:** Demographic profile of participants.

## Results

The different aspects of participants' self-coping strategies were examined (Table 2). A total of 81.71 percent of participants indicated living with others who helped with their mobility. Participants who used a walking aid (stick) were less likely to be male, more likely to be aged over 75 years, and more likely to be living with others. They were also more likely to have visual acuity of LogMAR -1.40 or less. Male participants were less likely to solicit for help with mobility ( $p < 0.001$ ). Participants aged over 75 years were significantly more likely to solicit help with mobility than those aged between 60-75 years. Participants who lived with others were more likely to ask for help with mobility than those who lived alone. Having a visual acuity less than LogMAR -1.40 is also significantly related to asking for help with mobility. One hundred and forty-seven participants (42%) indicated that they limited their mobility to only familiar places, and of this number, those aged 75+ years were more likely to restrict their movement than the younger participants. However, participants with post-secondary education and those with visual acuity less than LogMAR -1.40 were also significantly more likely to limit their mobility to familiar places, than others with secondary or primary education, and visual acuity better than LogMAR -140 respectively. Participants who had been blind for longer than 10 years were significantly less

likely to use a walking aid, less likely to solicit for help with mobility, and more likely to limit their mobility to only familiar places. As might be expected, participants living with others were less likely to limit their mobility to only familiar places ( $p < 0.05$ ).

	Using a walking aid	Soliciting for help with mobility	Limiting mobility to familiar places
<b>Constant</b>	0.20	0.61	0.01**
<b>Gender</b>			
Male	0.65*	0.58***	0.97
<b>Age (Reference: 60 - 65)</b>			
66 - 70	0.40	1.41**	0.44
71 - 75	0.50	0.87	1.16
75+	0.28**	1.31	1.55**
<b>Educational Level (Reference: Primary)</b>			
Secondary	1.46	1.16	1.54
Post-secondary	1.71	1.23	3.47*
<b>Household Composition (Ref: Single)</b>			
Living with others	2.19*	0.94*	0.61*
<b>V.A. (Ref: LogMAR -1.00 to -1.30)</b>			
LogMAR -1.31 to -1.40	1.53	1.55	1.65
LogMAR < -1.40	0.45*	0.56***	2.34*
<b>Duration of visual Impairment (Ref: 0-5 years)</b>			
6-10 years	0.86	1.52	1.34
10+ years	0.48***	0.61**	0.42**
Chi-Square test	13.41	11.30**	18.05
Negelkerke R <sup>2</sup>	0.29	0.08	0.19

**Table 2:** Logistic regression of self-coping strategies: Using a walking aid, Soliciting help with mobility and limiting mobility to familiar places.

\*Significant at  $p < 0.05$ , \*\*Significant at  $p < 0.01$ , \*\*\*Significant at  $p < 0.001$

Explanations for not seeking or participating in O&M RT were examined using Logistic regression analysis. The differences in the reasons for not seeking or participating in O&M RT are as shown in table 3. Male participants were more likely to mention not having a need or interest in O&M RT. Participants aged 66-70 years, as well as participants living with others, were also more likely to indicate not needing O&M RT. Men were significantly more likely than women to mention the cost of O&M RT as a reason for not seeking O&M RT. They were also more likely than women to be unaware of where to seek O&M RT. The age group (76+ years) were significantly more likely to mention the cost of O&M RT as a reason for not seeking O&M RT, and more likely to be unaware of where to seek O&M RT than other younger age groups. Participants living with others were more likely to mention stigma as a reason for not participating in O&M RT than those who lived alone. While many male and female participants mentioned being unaware of where to seek O&M RT, men were on borderline statistical significance ( $p=0.05$ ) for being more likely to state this as a reason for not going for O&M RT.

Explanatory variable	No need/ interest	Cost of O&M RT	Stigma	Unaware of where to take O&M RT
<b>Constant</b>	1.50*	0.15	0.11	0.06
<b>Gender (Reference: Female)</b>				
Male	1.68*	1.02*	1.03	0.55*
<b>Age (Reference: 60 - 65)</b>				
66 - 70	0.86**	1.31	1.34	1.27
71 - 75	1.32	1.67	1.68	2.13
76+	1.54	2.15**	1.99	2.39***
<b>Educational Level (Reference: Primary)</b>				
Secondary	1.15	1.45	0.73	2.01
Post-secondary	0.34	1.07	1.95	1.01
<b>Household Composition (Ref: Single)</b>				
Living with others	1.58***	0.47*	2.41***	0.81
<b>Visual acuity (Ref: LogMAR -1.00 to -1.30)</b>				
LogMAR -1.31 to -1.40	1.09	1.01	1.13	1.05
LogMAR < -1.40	1.42	1.75	0.98	0.62
<b>Duration of Visual Impairment (Ref: 0-5 years)</b>				
6-10 years	0.73	1.67	1.00	2.13
10+ years	1.51***	1.89	0.51*	2.06
Chi-Square test	19.15**	10.12	19.28	18.46*
Negelkerke R <sup>2</sup>	0.06	0.43	0.38	0.15

**Table 3:** Reasons for not seeking O&M RT analyzed using logistic regression.

\*Significant at  $p < 0.05$ , \*\*Significant at  $p < 0.01$ , \*\*\*Significant at  $p < 0.001$

## Discussion

This study investigated non-uptake of Orientation and Mobility Rehabilitation Training (O&M RT) and the reasons for not going for, or participating in, O&M RT among legally blind older people aged 60 years and over. Findings from the study showed that the majority of the participants reported not being aware of where to take up O&M RT. This finding resonates with previous findings of the general lack of public awareness about low vision rehabilitation as a significant barrier to the uptake of low vision rehabilitation and related services [26]. Findings suggest that participants coped with strategies such as using simple mobility aids (e.g., walking sticks), soliciting for help with mobility, and limiting their movements to only familiar places in their environment. The adoption of these coping strategies, however, varied significantly between participants relative to their demographics - such as living with others. A majority of our participants (74.86 percent) indicated that they lived with others who helped with their mobility. This is unsurprising as it is rare to find blind older people living alone in Nigeria. Research has shown that older blind white people are more likely to live alone than their African/American or black counterparts [27]. Only a few blind adults (if any) receive regular welfare or food stamps from the government in Nigeria. The lack of disability welfare support for blind older people perhaps makes it difficult for them to live alone and independently meet their basic needs.

From the study findings, participants who lived with others were more likely to ask for help with mobility than those who lived alone. They were also less likely than those who lived alone, to report that

they limited their mobility to only familiar places. A possible explanation for this finding is that, living with others possibly afforded the blind older adult participants much easier access to a network of family and friends who acted as sighted guides [28]. Our findings further showed that participants who lived with others were less likely to perceive the need for O&M RT than those who lived alone. This is not surprising given that living with others could enhance access to some level of physical assistance to performing daily activities and living alone could steer a compelling need for skills to enable independent living - including mobility. Male participants were less likely to solicit for help with mobility, and more likely to mention that there was no need for O&M RT. Also, men were more likely than women to be unaware of where to seek O&M RT. These findings appear consistent with previous studies showing that men are less likely to seek medical attention and less likely to admit a weakness with their health [29]. In Nigeria as well as many African countries, men who seek early medical attention are stereotypically seen as emotionally vulnerable, physically weak and effeminate [30,31]. This stereotype arguably leaves men less likely to seek help than women. Participants who have been blind for more than 10 years were significantly less likely to mention stigma as a reason for not going for O&M RT when compared with those who had been blind for less than 10 years. This finding resonates with conclusions from previous studies that, it is widely documented that patients with sudden or recent sight loss tend to feel stigma and shame, especially as such reactions are associated with the denial phase of being newly diagnosed with visual impairment [32]. While our study demonstrates that participants who have been blind for longer than 10 years are less likely to be bothered about stigmatization, not much research has been done to investigate how the feeling of stigma and shame recedes through the years of being blind, and at what point does such feeling diminish completely for many BVI persons - if it does.

Furthermore, participants who have been blind for more than 10 years were significantly less likely to use a walking aid, less likely to solicit for help with mobility, and more likely to limit their mobility to only familiar places. A possible explanation is that blind adults who have lived long periods with the challenges of being blind might have learned ways to cope with being blind. Some authors have shown that visually impaired individuals who have lived with severe visual impairment or blindness for long periods were more likely to have learned to adapt and led independent lives than their peers with shorter years of experience of living with blindness [33]. Again, this finding from the current study reflects a novel inference from the study in that it demonstrates how living with visual impairment for a prolonged period (without O&M RT) could be a major factor for disinterest and apathy towards the uptake of O&M RT. The extent to which delays in referrals and uptake of rehabilitation services could play a direct and negative influential role on the responsiveness of the patient remains scarcely documented in the research literature. Findings with our participants suggest that as coping skills necessary to move safely within the physical and spatial environment (particularly their home and living environment) had been learned, the tendency to disregard the need for O&M RT is near certainty. This finding has implications in the practice of O&M RT. Awareness of O&M RT should be made to visually impaired persons as early as possible. Again, referrals for O&M RT should be indicated by eye care professionals expeditiously before self-coping skills that foster lack of concern and/or enthusiasm for O&M RT starts to settle in. While some self-coping skills can be beneficial to the blind individual [34], as such skills could be associated with better quality of life [35], it could sometimes be a less positive

way of coping with being blind [36], and from our finding, could potentially compel the individual to procrastinate uptake of professional rehabilitation training and to eventually obviate the need for one.

This study has some limitations. Due to the low sample size, our sample may not be fully representative of the legally blind older adults' population. The explored explanatory variables for non-uptake of O&M RT among participants were moderate and consistent with previous studies focusing on non-uptake of rehabilitation services, the variables are, nevertheless, not exhaustive. Future research could, perhaps, investigate additional explanatory factors that can provide more robust explanations for legally blind older adults' non-uptake of O&M RT even when there are potentially myriad benefits of the training for them.

## Conclusion

This study looked at factors affecting the uptake of O&M RT among legally blind older people in Nigeria. The results showed that while legally blind older adults are likely to have different reasons for not taking up O&M RT, issues of lack of awareness of where to seek O&M RT and disinterest appear common. A major factor identified as strongly associated with eroding interest to take up O&M RT was the duration of blindness. Participants who had been blind for longer than 10 years were more likely to be disinterested in O&M RT; as they had perhaps already self-developed coping skills to move around and about their immediate environment. This study highlights the importance of early awareness creation as well as early referrals for O&M RT. However, more research is needed to understand the changing patterns of attitudes of this population towards the uptake of O&M RT.

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