Orientation and Mobility Services in Nigeria by Vision Status

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ABSTRACT:

In many developing countries, orientation and mobility (O&M) services and programs are inadequate. A survey of 296 visually impaired Nigerians was conducted in 2018 to assess availability of, and experiences with, O&M services and training. Three-fourths of those sampled were blind. O&M items were analyzed by vision status. Persons with partial sight were more likely than blind persons to use a cane without the assistance of a human guide and less likely to ask for help if lost and unaccompanied. However, they did not express more confidence in their ability to travel independently, suggesting a sense of stigmatization. Level of confidence was positively associated with the extent of training and degree of skill in both orientation and mobility, supporting the importance of training with sufficient intensity. Analysis revealed that many partially sighted individuals were substituting another device for a white cane, yet reporting either not wanting or needing a white cane, implying a perception of stigmatization. Among those owning white canes, blind persons reported more difficulty navigating independently, citing primarily physical impediments and adverse topographic conditions. Recommendations are made for local manufacture of white canes, improvements in physical infrastructure, and establishment of a national registry of all persons with disabilities.

Keywords: Orientation and Mobility, perceptions, blindness, partial sight, white cane, Nigeria

INTRODUCTION

To enhance the reader's knowledge and understanding of the two main terms employed in this paper, we first define these terms from practitioners' perspectives. According to Hill and Ponder (1976) orientation is "The process of utilizing the remaining senses in establishing one's position and relationship to all other significant objects in one's environment", while mobility refers to "the capacity, the readiness and the facility to move" (p. 115). In pedagogical contexts, the two terms refer to the teaching of the concepts, skills, and techniques necessary for a person who is blind or partially-sighted[1] to travel safely, efficiently, and comfortably through any environment and under all environmental conditions and circumstances (Griffin-Shirley & Trusty, 2017; Jacobson, 2013; Lowenfeld, 1950). Independent travel is contingent upon knowing where an individual is in an environment and knowing how to get there, coupled with having effective mobility skills (Griffin-Shirley & Trusty, 2017; Jacobson, 2013). The professionals who instruct blind people are called orientation and mobility (O&M) specialists (Griffin-Shirley & Pogrund, 2018). In many countries today, lack of proper O&M instruction provided by orientation and mobility specialists, access to the largely unstructured environment, and inaccessible transportation pose some of the most significant barriers to persons who are blind or partially-sighted in accessing medical, educational, cultural, employment, religious, and recreational opportunities. In this quantitative paper, the challenges that people with blindness or partial-sight encounter in developing countries, such as Nigeria, where O&M services and personnel preparation programs to prepare O&M specialists are at best patchy, are identified and discussed. Our objective is to describe the issues surrounding the O&M practices and needs of consumers, and how national and international efforts can be mobilized to improve the quality of life of these citizens who have hitherto been marginalized because of poor O&M training and services, among other essential competencies.

Official Policies Regarding O&M Services in Nigeria

National and international protocols have influenced the provision of O&M services and the inclusive education movement in Nigeria. Prominent among these are the National Policy on Education (Federal Republic of Nigeria, 2014) and the Discrimination (prohibition) against Persons with Disabilities Act (Federal Republic of Nigeria, 2018). Both policies, inter alia, recognize O&M skills as necessary for enhancing access to quality education, increased social interactions, and access to the environment for persons with visual impairments. In specific terms, Section 7 of the National Policy on Education alludes to white mobility cane (para. 122), and mobility training (para. 123) for people with blindness and partial sight. Unfortunately, the policy document is silent on the concept of orientation. In our estimation, this omission underestimates the value of this vital skill that is necessary for people with visual impairment to function with ease within home, school, and community settings.

Earlier, on September 24, 2010, Nigeria joined several countries in declaring support for disability rights by signing the Convention on the Rights of Persons with Disabilities (CRPD) and its Optional Protocol (The United Nations, 2006). Interestingly, the CRPD references mobility and orientation in several articles within the landmark document, including articles 4, 10, 20, and 24. It is worth noting that Nigeria became the 94th ratifier of the Convention and the 58th ratifier of the Optional Protocol (The United Nations, 2006). However, to date, the country has been unable to implement the provisions of the law.

Blindness and Visual Impairment in Nigeria

There is limited data available to estimate the prevalence of blindness or visual impairment in Nigeria. The best estimates come from a national survey of adults age 40 years or older conducted from 2005-2007 and published by Kyari et al. in 2009. They estimated a prevalence of blindness of 4.2% and of severe visual impairment (exclusive of blindness) of 1.5% for this age group. For younger Nigerians, data collected in multiple surveys was used by Resnikoff et al. (2004) to estimate a prevalence of blindness among children ages 0-14 of 0.12% and among persons ages 15-49 of 0.2%. These estimates compare to a worldwide prevalence of blindness for all ages of 0.58% and a prevalence of visual impairment (inclusive of blindness) of 4.24% (Pascolini & Mariotti, 2011). These data support the observation made by Griffen-Shirley and Bozeman (2016) that, as people age, the incidence of VI will also increase. In 2050, 6.3% of the Nigerian population will be over 60 years of age (HelpAge, 2015*).* Clearly, in Nigeria, it will be a challenge

[1] We use the term 'partially-sighted' rather than 'low vision' because it is the term used in the National Policy on Education (Federal Republic of Nigeria, 2014).

to meet the training needs of older persons with visual impairments and other disabilities in the years to come.

Earlier Works on Low Vision Services in Nigeria

Okonji et al. (2021) recruited patients 65 years and older, with severe visual impairment, and who had never participated in any O&M rehabilitation training (O&M RT) from 25 registered eye clinics in five southern and one central state in Nigeria. The survey included a question about the reason for not seeking or participating in O&M RT (no need/interest; cost; stigma; unaware of where to take training). Each of the four response choices was examined separately as the dependent variable in a hierarchical logistic regression model which included gender, age, education, household composition, visual acuity, and duration of visual impairment. In the regression for 'unaware of where to take training', males were more likely to have given this response than females (OR=0.55; $p<0.05$) and the oldest patients (age 76+) were much more likely (OR=2.39; $p<0.001$) than the youngest patients (age 60-65) to have given this response. There was an increasing trend in odds ratios across the four age categories, although it was not statistically significant.

Monye et al. (2020) conducted a survey of all nine of the tertiary hospitals with an ophthalmology unit in the southeast zone of Nigeria, serving a combined population of about 16 million people. Twenty-five eye care professionals completed a questionnaire and an in-depth interview regarding the hospital's provision of various low vision services and equipment. Of the 278 eye care professionals employed in these nine ophthalmology units, just 21 (7.5%) had received any training in providing low vision services. Just three of the nine units had provided low vision services in at least six months before the study. O&M training for patients was offered only at these three 'functioning' units. In interviews, providers commented on their own need for more and better training and funds for training.

Chiang et al. (2011) developed a survey instrument to ascertain the extent to which low vision services were provided in countries throughout the world in 2006-2008. Country contacts were identified through both government offices and non-governmental organizations for 195 countries. For those countries for which a survey was not completed, data was collected from experts in the field or other secondary sources where possible. More than half of the 46 African countries with data reported no low vision service availability. 'Coverage', defined in terms of the usage rate of low vision services, was poor in Nigeria (>0 but ≤ 10%). In developing countries, more than half of low vision professionals did not receive refresher training. Low vision services were provided and funded primarily by NGOs in half of the developing countries, and these services were almost exclusively clinical (i.e., not including training, such as O&M).

Purpose of the O&M Survey

The primary objective in conducting the investigation was to assess study participants' experiences and opinions regarding the provision of O&M services, the availability of O&M training, the acquisition of O&M devices like the white cane, the challenges that participants face when moving around the community, etc. The survey was conducted between May and August of 2018 to document the experiences of Nigerians who are blind or partially-sighted regarding O&M services. The administration of the questionnaire occurred while the lead investigator served as a Carnegie Fellow at the University of Jos, Plateau State, Nigeria. As far as we know, this study was the first of its kind in the country. Hence, the project's outcomes could be seen as providing authentic data for evaluating participants' satisfaction (or dissatisfaction) with O&M training and services, and government's commitment to O&M services for this special population.

METHODOLOGY

In 2018, the lead researcher obtained permission to conduct this survey from the Institutional Review Board (IRB) of Missouri State University (MSU) in the United States. At the same time, he liaised with professional and consumer organizations throughout Nigeria and compiled a list of agencies, schools, and centers for persons with visual impairment. He utilized the list to identify willing individuals who were subsequently trained for questionnaire administration. The training occurred by phone. These trained individuals volunteered to distribute and retrieve completed questionnaires at their respective institutions.

In total, 540 questionnaires were distributed to persons who self-identified as blind or partially-sighted, and 350 (64.8%) were returned to the lead author, who carried them back to MSU for data entry and analysis. A student worker entered questionnaire responses into an Excel spreadsheet. A total of 296 questionnaires (84.6%) were deemed sufficiently complete for analysis. Data cleaning was conducted using Excel and SPSS version 24 (IBM Corp.) was used for data analysis.

The chi-square statistic and Fisher's exact test are used to determine if there is evidence of a statistically signifi-

cant association (or lack of independence) in a cross-tabulation between a given variable of interest and vision status (i.e., blind or partially-sighted). The Pearson chi-square statistic is generally appropriate when both variables are on a nominal or ordinal level of measurement, the minimum expected value is at least one, and less than 20% of cells have an expected value of less than five. The maximum likelihood ratio chi-square statistic may be used judiciously when the last criteria is violated. In the case of a two-by-two cross-tabulation, Fisher's exact test may be used in lieu of a chi-square. Unlike the Pearson chi-square, Fisher's exact test is valid if one or more cells has a small, expected value or the sample size is small (McDonald, 2014).

Some of the variables of interest are on an ordinal level of measurement. In such cases, it is preferable to utilize a measure of association which can quantify the strength and nature of the relationship between two variables in a cross-tabulation. However, one condition is that both variables are measured on an ordinal level. The dichotomous variable vision status can be treated like an ordinal variable so that this condition is met (Hale, 2018). Somers' d is a measure of association which can be utilized when one of the two variables in a cross-tabulation is dependent. For these analyses, vision status is regarded as independent when cross-tabulated against dependent ordinal variables of interest.

The independent samples t-test is used to assess whether two population means are equal based on results observed in two independent samples from normal distributions. The variable of interest is, therefore, generally on a ratio or interval level of measurement. For these analyses, only the variable *age* meets this condition.

RESULTS

Demographic Characteristics

Table 1 presents the overall characteristics of the participants regarding vision status and basic demographics. Three-fourths of the participants classified themselves as blind and nearly two-thirds are male. The age in years was slightly positively skewed, with a mean of 29.4 years and standard deviation of 11.9 years (range 12-75).

A large proportion of the participants had at least a secondary school certificate or its equivalent (81.2%). Over two-thirds of participants were students. Among those employed, over half were civil servants. The age, education, employment, and residence distributions were consistent with the fact that many of the participating institutions were schools, including post-secondary.

The t-test for independent samples was used to examine the relationship between age and vision status. The mean and standard deviation of age was 30.6 (12.5) years for participants who were blind and 25.2 (8.6) years for participants who were partially-sighted. The mean difference in age and its 95% confidence interval (equal variances not assumed) was 5.44 (2.75, 8.13). The t-test was statistically significant (t = 3.99, 147.40 d.f., $p < 0.001$).

Cross-tabulations were generated for the demographic characteristics (excluding age) by vision status. Gender did not differ significantly by vision status (Fisher's exact test; p = 1.00; 2-sided). Employment status was statistically significantly associated with vision status (X^2_{LR} = 9.13; 3 d.f.; p = 0.02; unemployed or retired omitted). Individuals who were blind were somewhat more likely to be civil servants or self-employed than were individuals who were partially-sighted, while the persons who were partially-sighted were somewhat more likely to be students or employed in the private sector as compared to blind persons. Highest educational qualification did not vary significantly by vision status (X^2 = 7.68; 4 d.f.; p = 0.10; no formal education combined with primary school). Place of residence was not significantly associated with vision status (X^2 = 4.73; 2 d.f.; p = 0.09).

Education and place of residence were also treated as ordinal variables to take advantage of their directional nature. With respect to highest educational qualification, there was, again, no evidence of a significant association with vision status (Somers' d = -0.04; p = 0.62). Regarding a place of residence, however, there was evidence of a statistically significant association with vision status (Somers' d = -0.16; p = 0.03). Blind participants were more likely than partially-sided participants to reside in a village, and less likely to reside in a city.

Moving Around the Community

Table 2 shows the distribution of participants by a set of variables included to elicit information regarding their experiences in moving around their communities. Cross-tabulations were generated for the movement items by vision status. Although responses to the item " … how do you move around your community?" could be regarded as ordinal in nature, this item was treated nominally because human guides may not routinely be available to all participants who might desire them. This item was statistically significantly associated with vision status (X^2 = 29.14; 3 d.f.; $p < 0.001$). Participants who were blind were much more likely to report moving around "most of the time" with both a guide and a cane, compared to participants who were partially-sighted (33.9% vs. 15.0%).

Table 1 **Demographic Characteristics of Study Participants (N = 296)**

Characteristic	Percent
Vision status	
Blind	77.7
Partially-sighted	22.3
Gender	
Male	63.9
Female	36.1
Age (years)	
<=20	29.0
21-30	35.7
31-40	20.6
>40	14.7
Highest educational qualification[a]	
Primary school certificate or equivalent	18.8
Secondary school certificate or equivalent	37,6
Ordinary National Diploma or National Certificate Exam	19.9
Bachelor's degree or Honors National Diploma	17.4
Master's degree or equivalent	6.3
Employment status	
Student	69.3
Civil service	16.0
Private sector	5.8
Self-employed	7.2
Unemployed or retired	1.7
Residence	
City	41.6
Town	38.5
Village	19.9

Note: Individual characteristics may have missing values such that the total count is less than 296.
[a] Eight persons could not be classified with certainty and are thus omitted from highest educational qualification classes.

Table 2 **Experiences Moving Around Your Community (N = 296)**

Survey item	Percent
Most of the time, how do you move around your community?	
Without a cane or a sighted guide	2.8
With a cane	37.9
With a sighted guide	29.3
With a cane and a sighted guide	30.0
How would you rate your level of confidence in traveling independently?	
Very low	9.2
Low	17.7
Average	34.0
High	19.7
Very high	19.4
When you lose your way as you travel independently, do you ask for help?	
Yes	96.9
No	3.1

Note: Individual items may have missing values such that the total count is less than 296.

Persons who were partially-sighted were more likely to report either 1) moving around with neither a cane nor a guide (11.7% vs. 0.4%) or 2) moving around with a cane but without a guide (46.7% vs. 35.7%), than were persons who were blind.

Somers' *d* was selected to assess the association between the ordinal items " … rate your level of confidence …" and vision status. The value of Somers' *d* was 0.04 (p = 0.34) and hence did not support the presence of a significant association between the two. Fisher's exact test was used to assess the association between the item " … do you ask for help?" and vision status. The exact test supported the existence of a statistically significant association between the two (p < 0.001; 2-sided), whereby blind persons were more likely than persons who were partially-sighted to ask for help if lost and unaccompanied (99.6% vs. 87.7%, respectively).

Training and Knowledge/Skills in Orientation and Mobility

Participants were asked to evaluate themselves on four items related to O&M. The distributions of responses to these items are displayed in Table 3. Cross-tabulations of the four O&M items by vision status were constructed and assessed using the Somers' *d* test statistic. Intensity of orientation training (Somers' d = -0.05; p = 0.48), degree of orientation knowledge (Somers' d = -0.04; p = 0.66), intensity of mobility training (Somers' d = -0.01; p = 0.88), and degree of mobility skill (Somers' d = -0.10; p = 0.24) were not significantly associated with vision status.

Correspondence between Training and Knowledge/ Skills in Orientation and Mobility

As a side issue of interest, the correspondences between orientation or mobility training and resulting knowledge or skill were examined. The intensity of orientation training and degree of orientation knowledge exhibited a positive correspondence at a statistically significant level (Somers' d = 0.48; p < 0.001). Likewise, intensity of mobility training and degree of mobility skill corresponded positively at a statistically significant level (Somers' d = 0.50; p < 0.001).

These same comparisons were repeated separately for participants who were either blind or partially-sighted. The positive correspondence between orientation training and knowledge remained statistically significant for persons who were either blind (Somers' d = 0.46; p < 0.001) or partially-sighted (Somers' d = 0.54; p < 0.001). Likewise, the positive correspondence between mobility training and skill remained statistically significant for

Table 3 **Training and Skill with Orientation and Mobility (N = 296)**

Survey item	Percent
How much training have you received in orientation?	
None	10.3
Some	59.2
High (at least 40 hours)	30.5
How would you rate your current knowledge of orientation?	
No knowledge	6.6
Limited knowledge	18.3
Fair amount of knowledge	13.8
Good amount of knowledge	41.7
Very knowledgeable	19.7
How much training have you received in mobility?	
None	11.1
Some	55.0
High (at least 40 hours)	33.9
How would you rate your skill in mobility?	
No skill	6.6
Limited skill	18.8
Fair amount of skill	15.7
Good amount of skill	44.3
Very skillful	14.6

Note: Individual characteristics may have missing values such that the total count is less than 296.

persons who were either blind (Somers' d = 0.48; p < 0.001) or partially-sighted (Somers' d = 0.55; p < 0.001).

Correspondence between Confidence and Training or Knowledge/Skills in Orientation and Mobility

Of similar interest was the participant's rating of confidence in traveling independently and its correspondence to both intensity of orientation training and degree of orientation knowledge and to intensity of mobility training and degree of mobility skill. A statistically significant positive correspondence was demonstrated for each of the four relationships as follow: confidence and orientation training (Somers' d = 0.12; p = 0.01); confidence and orientation knowledge (Somers' d = 0.323; p < 0.001); confidence and mobility training (Somers' d = 0.18; p < 0.001); and confidence and mobility skill (Somers' d = 0.26; p < 0.001).

White Cane Ownership and Experiences

Participants were asked a set of questions regarding ownership of and experiences with obtaining and using a white cane. The distribution of responses to these items is shown in Table 4. All participants were asked the question "Do you have a white cane?" White cane ownership

Table 4 **Ownership and Experiences with White Canes**

Survey item	Percent
Do you have a white cane?	
Yes	54.1
No	45.9
If you do not have a white cane…	
Why not?[a]	
I cannot get a cane or cannot afford	74.2
I don't want to use a cane or do not need	7.8
I have not received training in use of the cane	4.7
I dislike the cane because it calls unnecessary attention to me	10.2
Other (specify)	3.1
If you do have a white cane…	
Where did you get your white cane?[a]	
Government ministry, agency, or school	17.0
Philanthropic organization	45.8
I bought it myself	30.1
Other (specify)	7.2
If you do have a white cane…	
Did you find it easy to get a white cane?	
Yes	37.8
No	62.2
If you do have a white cane…	
Do you have difficulty walking independently with a white cane?	
Yes	34.0
No	66.0
Own or use any cane (computed variable)	
Have a white cane	54.6
Use another type of cane[b]	27.8
Neither criteria met	17.5
Have you participated in White Cane Day in Nigeria?	
Yes	35.7
No	64.3

Note: Overall (n = 296); persons who have a white cane (n = 159); persons who do not have a white cane (n = 135).

[a] Some open-ended responses were recoded into classes shown.

[b] i.e., Do not have a white cane and, most of the time, move around community with a cane or with a cane and sighted guide.

was statistically significantly associated with vision status (Fisher's exact test; p = 0.008; 2-sided). Persons who were blind were more likely to report owning a white cane (58.3%) as compared to persons who were partially-sighted (39.4%).

Those persons answering "no" were next asked "If you do not have a white cane, why not?" A statistically significant association was found between this item and vision status (X^2_{LR} = 18.06; 3 d.f.; p < 0.001). Blind participants were more likely than participants who were partially-sighted to have responded that they either could not get a white cane or could not afford a white cane (86.4% vs. 52.8%). Participants who were partially-sighted were much more likely than their blind counterparts to respond that they either did not want to use or did not need to use a white cane (22.2% vs. 2.2%), or to respond that the white cane called unnecessary attention to them (16.7% vs. 7.6%).

Those persons answering "yes" to white cane ownership were asked three more questions regarding their experiences with a white cane. The first question elicited the source of their white cane. The chi-square test did not provide evidence of a significant overall association between the white cane source and vision status (X^2_{LR} = 5.89; 3 d.f.; p = 0.12).

This relationship was examined in more detail. When white cane source was dichotomized as "philanthropic organization" vs. "all else", Fisher's exact test (2-sided) was not significant (p = 0.19). However, when white cane source was dichotomized as "government ministry/ agency/school" vs. "all else", Fisher's exact test (2-sided) was statistically significant (p = 0.04), whereby partially-sighted participants were much more likely than blind participants to cite one of those sources of their white cane (32.0% vs. 14.1%).

The second question addressed the ease of obtaining a white cane. While a larger percentage of participants who were blind did not find it easy to get a white cane (65.4%), as compared to participants who were partially-sighted (46.2%), the Fisher's exact test provided evidence of only a weakly significant association (p = 0.08; 2-sided).

Those participants who answered "no" to finding it easy to get a white cane were asked to describe the difficulties they had experienced. Eighty (82.5%) of these participants provided an answer. Table 5 displays those answers by frequency of response. Cost and accessibility were the most frequently reported types of difficulty experienced, followed by donor issues. Examples of accessibility include "Not available in the market" and "I have to travel from Adamawa to Abuja for the white cane." Donor issues include responses such as "I had to write letters to philanthropic organizations" and "I waited for people of good will before I could get a white cane."

Table 5 **Cause of Difficulty in Obtaining a White Cane (N = 90)**

Survey item	Percent
Cost	53.8
Accessibility	40.0
Donor issues	22.5
Knowing where to find one	8.8

Note. Responses are from persons who have a white cane and who did not find it easy to obtain. Percents add to more than 100 due to multiple responses.

Table 6 Cause of Difficulty in Walking Independently with a White Cane (N = 59)

Survey item	Percent
Physical barriers/ Hazards or obstacles/ Road issues	44.0
Environment (non-specific)/ Unfamiliarity with the environment	22.1
Inadequate training	20.3
Motorist behaviors	15.3
Cane issues	8.5
Negative attitude from the public	6.8

Note. Responses are from persons who reported having difficulty walking independently with a white cane. Percents add to more than 100 due to multiple responses.

The next question (Table 4) probed into the difficulty of walking independently with a white cane. A statistically significant association was found between this item and vision status (Fisher's exact test; p = 0.01; 2-sided). Persons who were blind (38.3%) were much more likely than persons who were partially-sighted (12.0%) to report having had difficulty walking independently with a white cane.

Those participants who answered "yes" to finding it difficult to walk independently with a white cane were asked to describe the difficulties they had experienced. Fifty-nine (77.6%) of these participants provided an answer. Table 6 displays those answers by frequency of response. Physical impediments or adverse conditions were the most frequently reported causes of difficulty, followed by general environmental factors (e.g., "Being in an unfamiliar environment"), and inadequate training. An example of motorist behaviors is "Negative attitude from drivers when crossing roads." Cane issues include responses such as "If [cane is of] low quality, it bends or breaks."

Other Types of Canes

It was observed that 197 participants reported moving around their community, most of the time, either independently with a cane or with a cane and a guide, while only 159 reported owning a white cane. This observation led to a closer examination of the data. Based on responses to these two items, it is estimated that, while 54% of participants owned a white cane, an additional 28% were routinely using some other type of cane. Owning or using any cane (yes/no) was weakly significantly associated with vision status (Fisher's exact test; p = 0.09; 2-sided), with 84.6% of blind participants and 74.6% of partially-sighted participants classified as "yes". Among those either owning or using any cane, the type of cane (white/other) was weakly significantly associated with vision status (Fisher's exact test; p = 0.09; 2-sided), with 68.9% vs. 55.3% of participants who were blind or partially-sighted reporting white cane ownership, respectively.

White Cane Day

All participants were asked whether they had participated in Nigeria's White Cane Day, held annually on October 15th (see Table 4) The chi-square test did not provide evidence of a significant association between participation and vision status (Fisher's exact test; p = 0.18; 2-sided). Those participants who answered "yes" to participating were asked to describe the activities in which they were involved. Eighty-two (80.4%) of these participants provided an answer. Table 7 displays those answers, ordered by frequency of response. Participation in the White Cane Walk event was the most frequently named activity, followed by training in O&M skills.

DISCUSSION

The purpose of this investigation was to identify and analyze the challenges that participants with blindness and partial-sight face in their day-to-day activities and functioning in Nigeria. The data revealed, in part, that persons with partial-sight were more likely than those who were blind to commonly use a cane without the assistance of a human guide or to move around independently without either a guide or a cane, and were also less likely to ask for help if they were lost. However, partially-sighted persons did not rate themselves as being more confident than blind persons in their ability to travel independently. These findings may suggest feelings of inhibition typically exhibited by persons who have partial sight or low vision. The literature describes the identities of such individuals as "neither blind nor sighted but somewhere in between" otherwise known as the "neither-fish-nor-fowl phenomenon" (Sacks, 2010; p. 69). If people with low vision are trying to conceal that they have a visual impairment when they encounter a mobility situation where functioning visually is not safe, then these individuals may feel stigmatized (Fraser et al., 2019; Welsh, 2010). Sacks (2010) mentions individuals with low vision trying to pass as sighted persons can be unsafe. She calls

Table 7 **Participation in White Cane Day Activities (N = 84)**

Activity	Percent
White Cane Walk	48.7
Training in orientation & mobility skills	37.8
Traditional singing or dancing, games, or other entertainment	19.5
Information acquisition	8.5
Community education outreach	6.1

Note. Responses are from persons who have participated in White Cane Day. Percents add to more than 100 due to multiple responses.

for O&M specialists to teach a child and an adult with low vision in what situations it is important and safer for them to use a cane or monocular to "make them look more capable and competent than he or she would without them" (p. 84). Given the context of Nigeria, where standardized O&M training is yet to be established, and there is an absence of professional specialized counseling, one may see this trend as potentially disempowering for the population under study.

Orientation training and knowledge, as well as mobility training and skills, did not differ by vision status. For both partially-sighted and blind participants, orientation training was strongly positively associated with the degree of knowledge about orientation. The same was true of mobility training and mobility skills. These associations were consistent within classes of vision status. What is discernible from these findings is the consistency with which the two groups perceived that their needs had been addressed through available training.

Level of confidence in traveling independently was strongly positively associated with the extent of training for both orientation and mobility, as well as with the degree of skill for both. These findings underscore the importance of providing programs of sufficient intensity that will comprehensively address the special needs of these consumers. In fact, Sauerburger and Bourquin (2010) discuss the importance of blind persons receiving instruction in using a long cane to "anticipate ahead of the user and negotiating obstacles and changes in surface elevation (such as steps and curbs)" (p. 202). Similarly, Hill and Ponder (1976) state the primary purpose of the long cane is for information gathering, protection, and identification. Hoover (1950) noted that blind people throughout the centuries have been utilizing canes made from miscellaneous materials (e.g., bamboo, oak, steel, and alloys) to ensure adequate protection on their travels. O&M specialists can ensure individuals with visual impairment learn to be proficient with their cane without having to concentrate on its movement (Sauerburger & Bourquin, 2010).

Blind persons were more likely to own a white cane than were partially-sighted persons. However, persons who were partially-sighted were more likely than blind persons to report using a cane without the assistance of a human guide. These findings indicate that partially-sighted persons may be substituting another device in lieu of a white cane. In fact, the data indicate that a substantial number of visually impaired persons use a cane or cane-like device other than a traditional white cane. Also noted was that larger percentages of partially-sighted participants without white canes stated either that they did not want or need a white cane, or that the white cane called unnecessary attention to them, as compared to their blind counterparts. This suggests that the relatively high use of non-traditional white canes (or similar devices) may be attributable to perceived stigmatization (Smith & Geruschat, 2010). Welsh (1987) discussed that individuals with visual impairment can be stigmatized when they are in public because of the equipment they use, when those with low vision solicit aid, or how their eyes look from certain visual conditions. This stigmatization may be viewed as a label that individuals with visual impairment deviate from the norm and is not necessarily "a mark of infamy or disgrace" (p. 250).

While a majority of partially-sighted persons without a white cane, when asked why they did not have one, reported that they either did not want or need a white cane, a majority of blind persons without a white cane reported that they either had difficulty accessing or paying for a white cane. This is indicative of the general dilemma associated with persons with disabilities, including those with blindness, wanting to acquire specialized devices, but encountering real obstacles to attaining them. Among those persons who reported owning a white cane, blind persons were only weakly more likely than partially-sighted persons to have experienced difficulty in obtaining their white cane. Of those who experienced difficulty, the most frequently cited reasons were cost and accessibility. Accessibility was also the most frequently given reason for not owning a cane.

Based on the anecdotal comments collected in the survey, white canes are not widely available within the country. The cost of a white cane is relatively high in Nigeria, such that many visually impaired persons must rely upon donations from philanthropic organizations, religious bodies, or the government. Curiously, our data showed that partially-sighted persons with a white cane more frequently reported having obtained their cane from a government ministry, agency, or school than did their blind counterparts, but were only slightly less likely to report having obtained their cane from a philanthropic organization. This may suggest a more assertive nature of partially-sighted individuals over those with blindness. It is also possible that the latter group may be less aware of appropriate sources of support.

Blind persons were more likely to have difficulty moving around independently with a white cane as compared to partially-sighted persons. The most frequently cited reasons for such difficulties were physical impediments (e.g., unpaved sidewalks or uncovered

drainage systems) and adverse topographic conditions (e.g., muddy roads or potholes filled with water following a rain). These barriers, as noted by participants, predominate in the Nigerian environment, which is characterized by poor architectural planning and design. Encouragingly, the new Nigerian legislation on discrimination against persons with disabilities (2018) stipulates, among other requirements, that "… road side-walks, pedestrian crossings, and all other special facilities … made for public use shall be made accessible to and usable by persons with disabilities including those on wheelchairs and visually impaired" (p. 6). Similarly, in a 2010 study of 19 developing countries and 14 industrialized nations by the World Health Organization about what constitutes an urban area that promotes confident mobility, physical accessibility, service proximity, security, affordability, and inclusiveness for people over 60 years of age, the results indicated a need for cities to highlight enablement, not disablement (Plouffle & Kalanche, 2010).

Partially-sighted persons were equally as likely as blind persons to participate in White Cane Safety Day (Nigeria Association of the Blind, 2013). This demonstrates commitment from both groups to increase the public's awareness of the importance of the white cane. The white cane should be viewed as a tool of independence and self-esteem for visually impaired people. October 15th each year has been reserved to celebrate White Cane Day throughout Nigeria.

Limitations of the study

This survey targeted participants with blindness or partial-sight at schools, rehabilitation centers, as well as those in work settings from various states in Nigeria. We identified the participants from consumer and professional organizations in the country. As such, the participants constitute a convenience sample of youths and adults with visual impairments in Nigeria. Given the lack of a database of citizens with disabilities in Nigeria, this approach was considered the most pragmatic means of recruiting participants for the study.

Also, the average age of participants is 29.4 years. Hence, there is need to include other groups of people who are blind/visually impaired (e.g., children and more middle-aged and elderly, persons living in rural areas, etc.) before generalizing their experiences. In instances where participants are working at home or living in rural areas, the level of needs of O&M services and challenges might be different than those we have described from this study.

CONCLUSIONS AND RECOMMENDATIONS

As has been presented in this study, there are formidable challenges that negatively impact effective O&M practices in Nigeria. Nigeria lacks the capacity to prepare an adequate cadre of O&M personnel to deliver effective training throughout the country. Therefore, it is recommended that, in fulfillment of the country's commitment to domestic and international treaties, the government should set up a viable institute to train O&M specialists to meet the growing needs of their citizens with disabilities. The institute would provide professional training in O&M at diploma or degree levels. Among other responsibilities, the proposed institute would recruit and train interested candidates from within the country and from other English-speaking countries in Africa.

In addition, the institute would undertake research into attitudinal, cultural, social, and religious issues that may impact the discipline of O&M (Ajuwon, 2018). However, to enhance its status, the institute would be required to follow an approved O&M curriculum of study, similar to the standards prescribed by the Association for Education and Rehabilitation Accreditation Council - Higher Education Accreditation Council and the Academy for Certification of Vision Rehabilitation and Education Professionals (ACVREP, 2018) in the United States.

The program would be encouraged to capitalize on the recently formulated One- Time Alternative Pathway for certification in O&M. This would pave the way for internationally trained O&M Specialists to apply to become certified (ACVREP, n.a.). Ultimately, this approach would enable such trained specialists to work in other countries in Africa and beyond where their services may be needed.

Given the benefits associated with using the white cane, the government should make the device both affordable and accessible to users. Currently, the long, folding O&M canes most preferred by consumers in Nigeria are quite expensive since these devices have to be imported from overseas. Another recommendation could be for the government to explore manufacturing long canes locally, utilizing raw materials that abound in the country. While such a measure could result in reduced cost for consumers, there is also the prospect of the devices being exported to other countries in Africa where there is substantial demand.

Finally, participants in this study have expressed concerns related to environmental barriers, even in urban centers of the country. One main recommendation moving forward is for the government to implement the

concept of universal design in cities, towns, and villages regarding environmental planning. Universal design is not just beneficial to people with visual impairment, but to all individuals as well (Story et al., 1998). This would result in the government promoting key architectural ideas, including logical layout, visibility, and lighting – all of which could result in overall benefits for the society.

Furthermore, to best support people with visual impairments, appropriate mass media should be adopted to increase public awareness (Shrivastava et al., 2015). Once Nigerians are more aware of the importance of O&M services, there will be increased understanding and support to tackle the current challenges. To ensure sustainability and effective accessible services, future research should focus on comparing the needs of O&M services among different groups of people (e.g., different ages, different visual acuities, urban and rural areas) and fully integrating them into the national policies. In summary, we believe that professional O&M services can go a long way to improve the quality of life of consumers, thereby enabling them to participate fully in home, school, and community settings.

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