



# VISUAL DISABILITY: CAUSES AND IMPLICATIONS ON PATIENTS' DAILY LIVING

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## ABSTRACT

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**Objective:** To determine the causes and implications of visual disability (VD) on patients' daily living.

**Methods:** A cross section survey of 130 visually disabled (*vd*) Nigerians on visually related basic life activities, psychology and emotion in 2008. Both structured interview and relevant clinical examination were conducted for the *vd* to gather the necessary information.

**Results:** VD was due mainly to cataract (82, 63.1%) and glaucoma (29, 22.3%). At least 78% of the causes of the VD were avoidable (treatable, curable). VD reduced/eliminated available manpower/workforce and increased the number of dependants. The most severely affected activities included driving, reading, threading a needle, but most *vd* could still cope with feeding and wearing of clothes. The activities missed most by the participants were appreciation of the beauty of nature, people/object recognition and reading. There was an association between the activities missed most and the *vd* levels of education ( $P=0.001$ ) but not with gender ( $P=0.406$ ). Most participants (85%) expressed sadness over VD and reported sadness had an association with educational levels ( $P=0.042$ ) but not with gender ( $P=0.167$ ). Though (97.7%) thought life was meaningless due to VD, all (100%) had hope in regaining normal vision. Most participants (82.3%) expressed sadness over dependence on the sighted for basic visual demanding tasks.

*“Visual disability affects life activities, psychology, emotion and multiples dependency. Over 75% of the causes are avoidable underscoring blindness prevention and irreversibly blinds rehabilitation”*

**Conclusion:** Both cataract and glaucoma are leading causes of visual disability. Visual Disability diminishes quality of daily living and has economic, psychosocial and emotional implications. Renewed efforts towards preventing avoidable blindness and rehabilitating irreversibly blind will reduce the burden of *vd*.

**Keywords:** daily living, economy, mental health, visual disability, visual rehabilitation

## INTRODUCTION

Visual Disability (VD) occurs when visual function is worse than the acceptable limit for normal visual functioning with demonstrable objective and subjective impaired visual function. It may be reversible or irreversible. The visual functions whose impairments contribute significantly to VD include visual acuity, visual field, colour perception, contrast sensitivity and depth perception<sup>1</sup>.

Across the world, VD is on the increase due mainly to increases in population growth. Also, more people are now reaching old age<sup>2</sup>. These are not without implications for visual health as vision impairing conditions including cataract, glaucoma, age related macular degeneration, diabetes mellitus among others are common among the aged<sup>3</sup>. Globally, there are 314 million people with blindness and low vision<sup>4</sup>. Many of these conditions are avoidable.

VD has enormous implications on human life. The appreciation of the beauties of nature as well as sighting potentially life threatening situation at a distant location becomes uneasy tasks<sup>5</sup>. It is believed that approximately 90% of our daily activities require the use of our vision. As a result of varying limitations of VD on driving many established communities have mandatory vision screening for the issue or renewal of driver's license to ensure drivers are fit to safely operate vehicles<sup>6,7</sup>. In these communities visual acuity of at least 6/12 in both eyes, horizontal visual field of 70° in each eye and normal color perception are believed safe for driving<sup>6</sup>. On the other hand to educate *vd* would require more than usual resources making it 'special education'. This fact is well known among eye care practitioners that special education/vocational training though costly are usually prescribed for the *vd* with the belief it would make them 'relevant/useful' and 'self-reliant' in the society<sup>8</sup>. Nevertheless; to many *vd*, dependency on others for useful living becomes

indispensable and social dignity is reduced<sup>5</sup>.

Besides, there are other disturbing implications of VD. Economic loss is unequivocal<sup>9</sup>, about \$7.5 billion in lost productivity per year worldwide (10). VD affects human wellness; an Australian study reported that estimated loss of wellbeing attributable to visual disorders (measured in terms of years of healthy life lost as a result of disability [YLD]) was 40 068 years, and the net cost of loss of wellbeing was A\$4.82bn<sup>9</sup>. Moreover, VD threatens the *vd*'s existence including mental ill health, falls<sup>11</sup> and mortality<sup>12</sup>. In the Australian estimate based on the number of deaths, the number of years of life lost (YLL) as a result of visual impairment was 1119 YLLs. The estimate showed a staggering total lost years of healthy life (YLL and YLD) as 41 187 Disability Adjusted Life Years (DALYs)<sup>9</sup>.

The implications of VD on patients' daily living are many and cannot be overemphasized. Keeping associated challenges alive among all stakeholders would enhance advocacy and adequate management of VD across the society. The aim of this study was to determine the causes and implications of visual disability on patients' daily living.

## MATERIALS AND METHODS

This study was conducted at the eye clinics, Ekiti State University Teaching Hospital, Ado Ekiti from June to December, 2008 among consenting visually disabled (*vd*) [visual acuity 6/24 to Nil Perception of Light (NPL)]. The relevant information of consecutive *vd* were entered into proforma during routine consultations. The interviewer-administered structured-questionnaire, clinical clerkship and examination were employed to gather relevant information on the *vd*. The approval for the study was obtained from the University Teaching Hospital, Ethics and Research committee and consent to participate in the study

was taken from individual respondent. The study was conducted following the guidelines as contained in the Declaration of Helsinki. The inclusion criteria were Visual Acuity (VA) 6/24 or worse, informed consent and, ability to comprehend and respond intelligibly to questions asked. The VA 6/24 or worse was used in this study as it is the globally acceptable level of visual impairment, and demonstrable varying levels of visual functioning limitations. The information gathered on individual *vd* were entered into a performa and include VA, socio-demographic characteristics, cause /diagnosis of VD, and subjective rating on a scale of 1-3 (mild to severe) of how VD had negatively affected daily basic life activities. Others were what *vd* considered most missed due to VD, the considered challenges to getting improved/normal vision since visually impaired (the options included lack of money, fear of operation, lack of eye hospital in place of abode, lack of improvement having being to hospital) and psychological/emotional feeling since visually impaired (the patients were asked to select among options including being depressed, accepted the fate, being angry, regret, sadness, and being happy). The rest questions were in the form of yes and no format and these were on perception of life without normal vision, hope in regaining normal vision, and any felt concern about dependence on the sighted for vision challenging tasks.

The study was preceded by a pretest among respondents that were not included in the final analysis. A single interviewer administered the questionnaire on all the participants during the study period.

The results were collated, entered and analyzed using SPSS 15 (SPSS Inc., Chicago, IL, USA). Ordinal regression analysis was carried out to determine association between the activities missed most by the *vd* and their levels of education as well as gender. Also between *vd* expressed feelings and

their educational levels as well as gender. The significant association was taken at  $P < 0.05$ .

## RESULTS

### The patients' demographic characteristics

One hundred and thirty VD comprising of (74, 56.9%) males and (56, 43.1%) females with age range 19 to 95 years were surveyed. The age, gender, marital status, level of education and duration of visual disability distribution are shown in [Table 1]. The duration of VD for most, (104, 80%) of them was within 5 years.

**Table 1: Demographic characteristics of patients, n = 130**

Characteristic	no (%)
Male sex	74 (56.9)
Age, mean (SD)	66.2 (15.5)
Duration of visual disability (year)	
<1	32 (24.6)
1-5	72 (55.4)
6-10	17 (13.1)
>10	9 (6.9)
Marital status	
Single	8 (6.2)
Married	79 (60.8)
Separated	2 (1.5)
Divorced	3 (2.3)
Widowed	38 (29.2)
Education levels attained	
Tertiary	18 (13.9)
Secondary	20 (15.4)
Primary	26 (20.0)
No formal education	66 (50.8)

n, sample size; no, number of patients

### Causes of VD among the patients

VD was due mainly to cataract (82, 63.1%) and glaucoma (29, 22.3%). Of 260 eyes of 130 patients, 35 eyes (13.5%) were visually impaired (VA 6/24 - 3/60) and 225 eyes (86.5%), (including at least (25, 10%) irreversibly blind eyes) were blind (VA <3/60). At least 78% of the causes of the VD were avoidable (treatable, curable) [Table 2].

### Implications of VD on basic life activities of the patients

There was reduction in the workforce for public service, farming and artisan after VD. The driving and teaching vocations were absolutely affected by visual disability. The magnitude of dependants increased 40 times (4,000%) [from 2 to 81 before and after VD] [Figure 1].

The activities that were found most severely affected by visual disability include driving, reading and threading needle but most could still cope with feeding and dressing (wearing of clothes) [Figure 2].

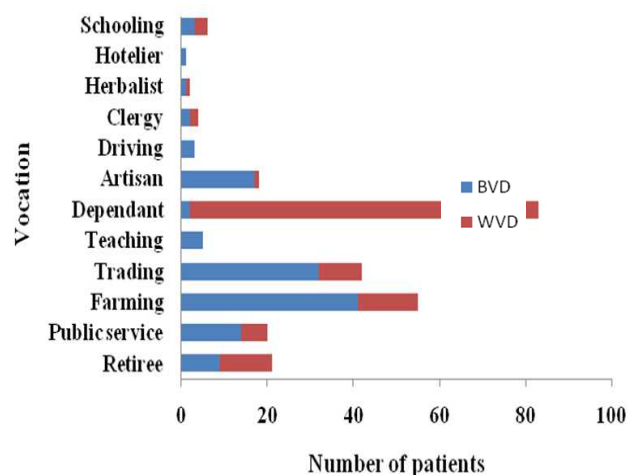
### Implications of VD on psychology and emotion of the patients

The activities missed most by many *vd* include work, appreciating the beauty of life, recognising people/object and reading. There was association between the activities missed most by the *vd* and their levels of education ( $P=0.001$ ) but not with gender ( $P=0.406$ ). Most, (111, 85%) expressed sadness over not enjoying normal vision and the expressed feelings had association with their educational levels ( $P=0.042$ ) but not with gender ( $P=0.167$ ) [Table 3].

Most, (127/130, 97.7%) thought life was meaningless because of their visual disability but all, (130, 100%), including the irreversibly blind, had hope in regaining normal vision. Most, (107/130, 82.3%) were concerned about their dependence on the sighted for (normal) vision demanding tasks.

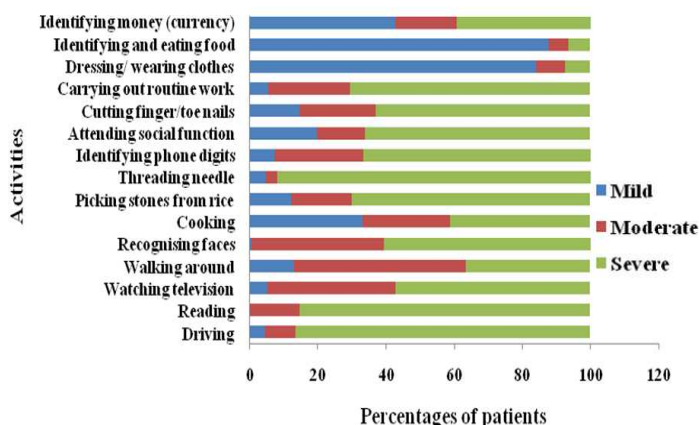
### The challenges faced by *vd* towards improved vision

The challenges faced by *vd* towards getting improved vision is shown in [Table 4]. The most common include; being to hospital without improvement (74, 57%), lack of fund (18, 14%) and ignorance (10, 8%).



**Figure 1: Vocational distribution of patients before and after visual disability.**

BVD, before visual disability; WVD, with visual disability.



**Figure 2: Degree of difficulty faced by visually disabled in carrying out daily activities**

The list of vision dependent common activities and the number of visually disabled who provided information on each of the activities: Identifying money (currency notes) 28; Identifying and eating food 123; Dressing, identity and wearing clothes 120; Carrying out routine work 125; Cutting finger/toe nails 129; Attending social function 115; Identifying handset letters/numbers 66; Threading needle 123; Picking stones/contaminants from rice, beans etc 73; Cooking 51; Recognizing faces 129; Walking around 121; Watching television 112; Reading 88; and Driving 44.

Table 2: Distribution of diagnoses by visual acuities among the patients

Diagnosis	Visual acuity										Total
	6/24-6/60		<6/60-3/60		<3/60-1/60		HM-PL		NPL		
	RE	LE	RE	LE	RE	LE	RE	LE	RE	LE	
Cataract	8	4	4	5	25	27	32	35	3	1	144
Glaucoma	3	2	2	3	6	6	13	12	5	6	58
Optic atrophy	1	1	-	-	2	-	1	1	-	2	8
Maculopathy	1	-	-	-	1	2	-	-	-	-	4
Retinitis pigmentosa	-	-	-	-	1	-	1	2	-	-	4
Bullous keratopathy	-	-	-	-	-	-	2	2	-	-	4
Ocular dystrophy	-	-	-	-	1	1	1	-	-	1	4
Aphakia	-	-	-	-	1	1	1	1	-	-	4
Ocular trauma	-	-	-	-	-	-	1	2	1	-	4
Couching	-	-	-	-	2	1	-	1	-	-	4
Complicated uveitis	-	-	-	-	2	1	-	-	-	1	4
Ametropic amblyopia	-	-	-	1	2	1	-	-	-	-	4
*Others	-	-	-	-	2	4	2	1	3	2	14
<b>Total</b>	<b>20</b>		<b>15</b>		<b>89</b>		<b>111</b>		<b>25</b>		<b>260</b>

RE, right eye; LE, left eye; HM, hand motion; PL, light perception; NPL, nil light perception. \*1 (0.8%) each of cornea opacity, complicated microbial keratitis, multiple sclerosis, ocular tumour, retinal detachment, surgical complication, toxic (alcohol) amblyopia

Table 3: Associations of education, gender, activity missed most and expressed feelings of visually disabled, n = 130

		Activity missed most because of visual disability					Total
E level	Beauty of life	Reading	Recognizing person/object	Work	Walking /socializing		
NFE	18	5	13	22	8	66	
Primary	5	6	8	7	0	26	
Secondary	3	5	5	6	1	20	
Tertiary	4	9	3	0	2	18	
<b>Total</b>	<b>30</b>	<b>25</b>	<b>29</b>	<b>35</b>	<b>11</b>	<b>130</b>	
$\chi^2=18.111, df=4, P=0.001$							
Gender							
Male	20	16	13	20	5	74	
Female	10	9	16	15	6	56	
<b>Total</b>	<b>30</b>	<b>25</b>	<b>29</b>	<b>35</b>	<b>11</b>	<b>130</b>	
$\chi^2=4.003, df=4, P=0.406$							
		Patients' expressed feelings about visual disability					Total
E level	Depressed	Accepted fate	Regret	Sad	Prefer death to blindness		
NFE	6	1	2	56	1	66	
Primary	0	1	2	23	0	26	
Secondary	0	1	0	19	0	20	
Tertiary	1	3	0	14	0	18	
<b>Total</b>	<b>7</b>	<b>6</b>	<b>4</b>	<b>112</b>	<b>1</b>	<b>130</b>	
$\chi^2=9.903, df=4, P=0.042$							
Gender							
Male	2	5	3	64	0	74	
Female	5	1	1	48	1	56	
<b>Total</b>	<b>7</b>	<b>6</b>	<b>4</b>	<b>112</b>	<b>1</b>	<b>130</b>	
$\chi^2=6.465, df=4, P=0.167$							

n, sample size; E, education; NFE, no formal education

Table 4: Challenges faced by vd towards improved vision

Challenges	Male	Female	Total
Being to hospital without improvement	43	31	74
Lack of money	13	5	18
Ignorance/fatalism	5	5	10
Lack of eye hospital in a place of abode	3	5	8
Lack of escort	3	4	7
Previously coping with eye glasses	2	1	3
No delay, sudden deteriorated vision	3	1	4
Fear of surgery	0	2	2
Lack of time	1	0	1
Trying other option	0	1	1
Hospital delay	0	1	1
No known reason	1	0	1
<b>Total</b>	<b>74</b>	<b>56</b>	<b>130</b>
$\chi^2=12.333, df=12, P=0.419$			

## DISCUSSION

This study documents the causes of visual disability and the implications of VD among a cohort of patients with visual acuities of 6/24 or worse in a Nigerian tertiary health facility. The study found that about half (51%) of the cohort had no formal education which might be a result of the visual status of many of the participants. Vision plays significant role in learning process. The major causes of VD among the cohort were cataract and glaucoma and at least 78% of the causes of the VD were avoidable (treatable or curable). This underscores the need for renewed efforts towards tackling preventable causes of VD including among others cataract, glaucoma and ocular trauma. This study brought to fore the economic implications of VD to the individual, the family and society at large. There was reduction in the workforce for public service, farming and artisan following VD. The driving and teaching vocations were absolutely affected by VD. The magnitude of dependants increased 40 times, a 4,000% increase. Lost vision accounts for estimated \$7.5 billion in lost productivity per year worldwide (10).

It is notable that most of the studied cohort (n=93, 72%) were in the retirement catchment age (above age 60); this finding is not unusual for debilitating health conditions. Therefore, age and possible disease state might be cofounders to VD and the magnitude of dependants/reduced workforce among the cohort might not be solely due to VD. This notwithstanding, the fact is many individuals with normal vision are active post-retirement and contribute significantly to the world economy. While VD could complicate the existing (other) disabilities, it reduces productivity among those with or without other disability as found in this study.

As in this study the impact of visual impairment on well being of individuals including difficulty in mobility, self care and day to day usual activities have been reported elsewhere (13,14). The activities that were found most severely affected by

VD include driving, reading and threading a needle but most could still cope with feeding and dressing (wearing of clothes). Feeding and dressing essentially are 'gross actions' and not as visually demanding as reading fine prints or threading needles. Following VD the estimated loss of wellbeing is staggering; in a study in Australia (2004) estimated loss of wellbeing attributable (years of healthy life lost as a result of disability, YLD) to visual disorders was 40 068 years, and the net cost of loss of wellbeing was A\$4.82bn (9).

This study also found that VD was associated with difficulty identifying money. Cases of *vd* being cheated on money exchange are not uncommon in the society even by close relations. Also many *vd* confirmed difficulty recognising faces in this study.

In a study in Bangladesh, patients visually impaired due to cataracts were more likely to report problems with mobility, self-care, daily activities, pain and depression/anxiety and had poorer self-rated health than normal vision controls. Visual impairment due to cataract not only impacts on vision-related quality of life but is associated with a poorer perception of own health and well-being (15).

Many *vd* have voluntarily left or changed vocations (16). It is not rare to find *vd* being forced out of job by employer/self. Contrarily, some *vd* may dangerously manage to cope for various reasons among others economic and social stigma.

Occupational rehabilitation for *vd* confirms VD has implications on vocation. VD is a contraindication to known vocations like pilot, driving and construction works. Becoming less active from VD either by being forced out of job or otherwise may have implications on healthy living and may contribute to morbidity and mortality among *vd*. VD can increase mortality among the patients (12). In the Australian estimates based on the number of deaths, the number of years of life lost (YLL) as a result of visual impairment was 1119 YLLs. The estimate showed a staggering total lost years of

healthy life (YLL and YLD) as 41 187 DALYs (9).

Man is a social animal and VD does reduce social outings of the affected. It is not unusual to find people in the community advising *vd* to stay indoors. Many *vd* especially those with high social class/dignity may not even go out for fear of falling down/ embarrassment. It has been reported that impaired visual acuity significantly reduces participation in social or religious activities of daily living, and visually intensive tasks (17,18). VD is implicated in falls among patients (11).

Many admitted difficulty cutting toe and finger nails, a pointer to potential poor hygiene which has implications on the health of *vd*. The reported difficulty among some *vd* in sorting stones/dirt or any other contaminants from raw food items such as beans and rice before cooking and some being outrightly unable to cook might translate to not having desired meal especially among the poor *vd*. This may predispose to hunger, reduce immunity and infection leading to morbidity and mortality.

This study was able to establish emotional and psychological challenges among *vd*. The majority of the participants (85%) expressed sadness about being *vd*: 8% were depressed, 5% claimed to have adapted and 2% regretted their visual conditions. Disabling eye conditions are known reasons for emotional and psychological challenges among patients (19). Furthermore, most, 97.7% thought life was meaningless and 82.3% were concerned about their dependence on the sighted for (normal) vision demanding tasks. As in this study *vd* dependence on others for daily activities such as community and / or family support (20), and nursing home placement (21) have been reported. Interestingly, all the respondents (100%) including those who were found to be irreversibly blind (10%), (visual acuity of nil perception of light), had hope in regaining normal vision. It might be possible that being able to keep hope alive had helped the *vd* especially those having visual acuity

of nil perception of light.

Many challenges militating against *vd* getting improved vision were found in this study. Most of the studied cohort (74%) could not get improved vision following hospital consultations. Reasons for this finding could be that some (10%) were irreversibly *vd*, some went to hospitals not having eye care services and some were having 'immature' cataract that were 'thought inoperable' and would take time to 'mature'. Inability to afford eye care services is a challenge noted among *vd* and is a known major barrier to uptake of eye care services (22). Ignorance and beliefs that visual disability is a normal life process (fatalism) were among challenges militating against seeking eye care services towards improved vision by some studied cohort. Other important challenges found in this study included non availability of eye hospital, lack of escort, previous use of eyeglasses, fear of eye surgery, lacking time, trying alternatives to orthodox eye services, hospital bureaucracy and unknown reason.

## CONCLUSION

VD has enormous implications on life, culminating in diminished quality life. The economic and job loss leading to reduced work force and increased dependency are underscored. The psychosocial and emotional disturbances are indicative of mental ill health among *vd*. Overall, VD is potentially life threatening and can increase mortality among *vd*. Renewed efforts towards preventing avoidable blindness and rehabilitating irreversibly blind will reduce the burden of *vd*.

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