



CHAPTER 3

VISUAL IMPAIRMENT IN NIGERIAN CHILDREN AND ITS IMPLICATION ON LEARNING

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Introduction

According to the United Nations convention (2013), on the rights of the child, a child is any person under 18 years. They are a vulnerable group in any population and deserve all the protection they need. Hence the United Nations Convention on the Rights of the Child in 1989 where world leaders made a historic commitment by adopting an international agreement on childhood. UNICEF (2022,) further stated that protecting and improving the health of children is an integral part of these rights in quotation and is of fundamental importance.

WHO (2022), stated that vision is a basic component of health for which impairment is of significant economic, social, emotional importance; going by the WHO definition of health, vision comprises multiple interconnected functions such as acuity, fields, colour vision, depth perception and higher cognitive functions (Solebo & Rahi, 2014). From birth and as a child grows over the first few years of life, there are a number of time bound changes in the development of the ocular structures and other components of the visual pathway. Any delay, interruption or derangement of this natural process, will result in a loss or abnormal function of the structure responsible for that particular visual function.

Impairment is a term for any loss or abnormality in structure, physiological or psychological function while visual impairment (VI) on the other hand is the limitation of functions of the visual system (Mandal, 2019), which Eze (2021), recognized as a common form of disability. However, VI and childhood blindness are not as common in children as they are in adults. Globally, it is estimated to be between 3 and 15 per 10,000 in high and low income populations respectively (Rahi and Cable, 2003); but its presence is a significant source of concern to stakeholders especially when severe (CDC, 2020). This is because children with severe visual impairment and blindness have a longer life year to live compared to an adult and this has significant impact in the child's development, the immediate family and the society such a child interacts in. CDC (2020) reported that more than half of children with severe visual impairment and blindness have one or more other forms of developmental disability such as hearing loss, cerebral palsy, delayed motor, language cognitive, emotional and social development. These also include



certain systemic syndromes, and all of which have lifelong consequences such as learning difficulties (WHO, 2021).

A key informant study in an under-served community in South East Nigeria reported a low prevalence of childhood blindness and severe visual impairment of 0.12 per 1000 children (0.012%), but the worrisome aspect is that this was avoidable in 60% of the population (Aghaji et al. 2017).

In the preceding paragraphs, a number of lifelong consequences of severe visual impairment in children were mentioned. These have a negative impact on the quality of life (QoL) of these children due to the morbidity laden nature of conditions responsible for severe VI and blindness, as it limits their general participation in activities, communication and social interactions (Rainey et al. 2018). Also children with severe visual impairment comparatively have poorer school performance than their better sighted counterparts (WHO, 2021).

This chapter seeks to give an overview of visual impairment in children, discuss various aspects of visual impairment as a social disadvantage and source of social exclusion, categories of visual impairment, causes of visual impairment, low vision in children, management of children with visual impairment, needs of children with visual impairment, and inclusive education. International declarations by WHO and UN, Policy implications as well as recommendations shall be discussed and chapter concluded.

Visual Impairment as a Social Disadvantage and Source of Social Exclusion

VI which happens to be a most common form of disability has been in literature as a social disadvantage and source of social exclusion, also has negative impact on health, other outcomes, education and other vital indices of human development (Eze, 2021). Already, VI, especially the severe visual impairment (SVI) and blindness have been shown to be unevenly distributed with the majority found in low and middle income countries (LMICs) due to existing inequality and inequity in availability and access to health care across nations (Eze, 2021). The impact of this is felt by the individual directly affected, the immediate and extended family, neighbours and the society at large (National Academy of Sciences, 2016). For an adult with SVI or blindness, employability, family finances, housing and nutrition, children's education, etc, are all negatively affected (Eze, 2021). This has an endless list of social disadvantages and can continue in a vicious cycle, with social exclusion being the final result if left unabated. Hence the saying that blindness is a cause and consequence of poverty which is arguably the most important social disadvantage and source of exclusion on its own merit, and a very potent determinate for every other social disadvantage and source of social exclusion.

The effect of this on the individual, family and society can be expressed in direct monetary and non-monetary terms. Many of these may require an economic evaluation study which is beyond the scope of this chapter. However, a few qualitative indices are worthy of note such as reduced quality of life (QOL – an



individual or group's perception of their position in life in the context of culture and value system in which they live and in relation to their goals, expectations, standards and concerns), quality adjusted life years (QALY – a standard term for measurement of disease burden which combines survival and health related-QOL), and disability adjusted life years (DALY – time-based measure which combines years of life lost -YLL- due to premature mortality and years of life lost due to time lived in states less than full health, or years of healthy life lost due to disability – YLD-), etc. (WHO, 2012; Howren, 2013; WHO, 2022).

Categories and Causes of Visual Impairment

Category O: mild level Impairment: presenting visual acuity worse than 6/12 and better than 6/8.

Category 1: Moderate Visual Impairment: presenting visual acuity worse than 6/18 and better than 6/60

Category 2: Severe Visual Impairment: presenting visual acuity worse than 6/60 and better than 3/60

Category 3: Blindness: presenting visual acuity worse than 3/60 (WHO 2009).

Near Vision Impairment: Near Visual acuity worse than N6 at 33cm.

The following factors also can influence an individual's experience of visual disorder, the availability and or affordability of prevention and treatment interventions including accessibility of vision rehabilitation services.

Causes of Visual Impairment in Children.

There is a considerable difference in the causes of visual impairment between and within countries depending on the availability of eye care services, their affordability and the level of eye care awareness of the population. Among children, the causes differ largely across countries; While congenital cataract is a leading cause in low-income countries, retinopathy of prematurity is more likely in middle income countries, where as in adult populations uncorrected refractive error remains a leading cause of visual impairment in all countries

The 5 leading causes of visual impairment amongst others in children are:

Cortical Visual impairment (CVI): a neurological disorder resulting in a particular visual response to people, instructional materials and environment.

Optic Nerve Atrophy (ONA): is a permanent visual impairment which occurs from damage of the optic nerve. The optic nerve works like a cable carrying information from the eye to be processed by the brain. The optic nerve is made up of over a million nerve fibres (axons). When some of these nerve fibres are damaged through disease, the brain fails to receive complete visual information causing blurry vision (Sihota and Tandon, 2019).

Albinism: is the absence or reduced pigment called melanin in the eye, skin or hair which is needed for full development of the retina. Lack of melanin in retinal development causes albinism.



Optic Nerve Hypoplasia (ONH): This is the underdevelopment of the optic nerve during pregnancy. The condition is not usually inherited, it is not progressive and it cannot be cured. ONH is one of the three most common causes of visual impairment in children.

Retinopathy of Prematurity (ROP): is an eye defect which affects premature infants. It affects immature blood vessels of the retina and occurs weeks after birth. A child is not likely to have this condition once his blood vessels are well developed.

Other causes of visual impairment and blindness in children include; cataract, strabismus, uncorrected refractive errors, paediatric glaucoma, trauma, amongst others.

Low Vision in Children

Low vision in children is an irreversible vision loss or permanent visual impairment in an individual younger than 21 years of age which cannot be improved with refractive correction, medical treatment or surgical intervention (Fontenot et al. 2018). Low vision can be congenital or acquired. This ocular challenge can pose a problem for a child to the extent of affecting his/her developmental milestone (Keirstan, 2022). Thereby hindering such a child from achieving his educational goal, and hampering his/her social relationship, self-worth and independence.

Low vision according to WHO (2009); is a condition in which a person has impairment of visual function even after treatment or a standard refractive correction, and has an acuity of less than 6/18 to light perception (LP) or a visual field of less than 10% from the point of fixation but who uses vision for planning and executing task. Low vision implies that visual impairment has failed to be corrected through medications, spectacles, surgery or use of contact lens; thereby making it difficult for the child to perform everyday tasks such as reading prints.

This vision deficiency in our society today poses a serious concern as it involves children and adults alike who have some residual vision but are still being treated as though they are totally blind especially in schools where they find themselves. This condition is particularly disturbing for the child as the number of blind years of incapacitation is great when compared to the aged who may die in no distant time (Akanj et al., 2019).

Low vision in a child does not mean that child cannot be educated, rather it indicates that this particular child may need to learn through a different means with the aid of vision-enabling devices, adjustment in the classroom and modification of teaching-learning process. The treatment that may be recommended to assist children with low vision will include but not limited to the use of highly powered glasses, magnifiers, binoculars, telescopes or photo-chromic lenses (Prakalapakorn et al. 2022).



Management of Visual Impairment in Children

Management of visual impairment depends on the cause and category of impairment. All causes of visual impairment listed above have a recommended management plan based on the natural history of the condition. While conditions such as refractive error could be managed with spectacle, others such as paediatric cataracts could be managed with cataract surgery with variable prognosis depending on timing of surgery and other factors in the eye. There are causes of visual impairment (VI) (especially the hereditary ones) that are not amenable to conventional treatment. Depending on the category of VI the child can be profiled in line with the expected treatment outcome.

Majority of children with mild and moderate VI suffer some degree of refractive error which can be corrected with spectacles. However one major challenge with spectacle correction is non-compliance. In a more recent study in Onitsha, Nigeria, Ezinne et al. (2020), reported a spectacle utilization rate of 20.6% among primary school spectacle wearers and the major reason for this low rate was parental disapproval and misconception. A major problem with denying children with refractive errors who need to use a pair of spectacle is that they can eventually develop a condition called amblyopia ('Lazy Eyes', the details of amblyopia is beyond the scope of this chapter) later in life which is very difficult to manage but could have been easily prevented with simple use of spectacle at an early age. Proper counselling and education for parents and wearers is needed in order to overcome this challenge.

Most patients with severe visual impairment, their management will depend on cause, some will do well with spectacle correction and specialist ophthalmic care. A good number of them fall under the low vision category which most time improves by prescription of appropriate low vision devices. Management of low vision is both optical and non-optical. Optical involves use of low vision aids or devices while the non-optical essentially has to do with environmental modification such as improved lighting, contrast, removal of harmful objects and proper arrangement of room or house, enable a low vision patient locate things in the house easily. Consultation with a trained low vision care provider (ophthalmologist, optometrist or ophthalmic nurse) can advise appropriately.

For those who fall within the blindness range definitely will need visual rehabilitation on how to navigate their environment for everyday life, safety tips, learning, etc. Habilitation and rehabilitation fall under the purview of the special education professionals. They may also need psychotherapy following diagnosis and various forms of continuous professional counselling.

Needs of Children with Visual Impairment

Like every other child, children with visual impairment have common needs. However, there are needs that are unique to children with VI. Vision being the primary learning modality for children as there is no other sense with the ability



to stimulate interest, curiosity, and harmonise information efficiently as the sense of vision. A child with VI has to navigate through a world with incomplete messages from other senses and is left to one's imagination to 'fill the dots' in a bid to interpret information arising from the incomplete messages received (TSBVI, 2022). Such a child, especially those in the legally blind category is left with a major challenge of developing problem solving skills needed for cognitive development. There usually is no other option than to rely on integration of verbal, auditory, olfactory and tactile senses to describe their experience.

Inclusive Education

Inclusive education is an education system that has all children in the same class, in the same school irrespective of social class or any physical challenge they may have (UNICEF, 2022). It allows students of all backgrounds to grow and learn together to the benefit of all. It is the most effective way of all to acquire skills they need to thrive under fair conditions in school (UNICEF, 2022).

Due to a lot of civil activisms rising from 1989 Convention on Rights of the Child, the Salamanca Statement in 1994, Dakar Framework for Action in 2000, and the Convention on the Right of Persons with Disabilities in 2006, there has been an increasing interest and awareness for inclusive education for children with disability (Fanu et al, 2022). In 2015, the UN General Assembly (UNGA) adopted the 2030 development agenda. Also, state and non-state actors have been committed to improving 'inclusive education, quality and equitable education for children with disability by 2030 as part of the Sustainable Development Goals (SDG 4) (UN, 2015).

Policy Implications and Recommendations

Nigeria and many other countries have documented policies to improve the lot of children with visual impairment. For Nigeria, it's more of an issue with implementation, and all that can be done is advocacy in line with international recommendations and declarations especially relating to rights and inclusive education.

UNICEF is at the forefront of advocacy and discussions, aimed at promoting inclusive education and targeted at policy-makers and the general public. They also shine a spotlight on the needs of children with disability by generation of credible data through research, thereby creating the needed awareness. Other ways of contributing include technical support, manpower development and monitoring of activities of member states and partners.

Conclusion

This has provided an overview of visual impairment, the causes and categories, the implication in a child's educational development, management of VI, and inclusive education. Other aspects highlighted right, advocacies as related



to development of policies. These are tit bits as certain details are beyond the scope of this chapter. Some of such details could be obtained from the cited references.

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