

## Eye health myths, misconceptions and facts: results of a cross-sectional survey among Nigerian school children

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A – Study Design, B – Data Collection, C – Statistical Analysis, D – Data Interpretation, E – Manuscript Preparation, F – Literature Search, G – Funds Collection

**Summary Background.** Vision is critical in the development and performance of children. Factual knowledge of eye health is important for preventive and promotive eye health.

**Objectives.** To identify eye health myths and misconceptions that are considered true in a population of Nigerian school children, with the aim of prioritizing eye health messages.

**Material and methods.** In a cross-sectional survey, self-administered questionnaires were used to obtain pupils' views, which were elicited using statements presented as 22 ocular health myths/misconceptions and three facts in two selected secondary schools in Enugu state, Nigeria in October 2014. Frequency counts and percentages were generated using SPSS v18. A *p*-value of < 0.05 was considered statistically significant.

**Results.** The sample comprised 404 males (48.5%) and 429 females (51.5%), age range 10–17 years, median 13–14 years; IQR –6). More pupils in the senior classes had previously listened to eye health talks. The most common beliefs concerned the statements “staying close to the television set will damage vision” 782 (93.9%), and “reading in dim light will damage vision” 758 (90.8%). The least commonly-held misconception was “children do not need regular eye checks” 119 (14.3%). The greatest amount of uncertainty concerned the statements “short-sightedness is worse than long-sightedness” 421 (51%), and “crossed-eye disorders cannot be corrected in children” 383 (46%).

**Conclusions.** The majority of the children do not have information on eye health. Despite the persistence of these myths and misconceptions, this study has demonstrated that the children had a reasonable level of knowledge in terms of safe eye care practices. However, appropriate eye health messages still need to be provided.

**Key words:** eye, schools, child, superstitions, education, Nigeria.

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### Background

Vision is critical in the growth, development and performance of children, since 80% of what they learn is acquired through the processing of visual information [1]. Undetected and unresolved vision-related problems may therefore have diverse psychological, educational, vocational, functional, socio-economic and quality of life implications [2]. In recognition of this, The World Health Organization's bulletin VISION 2020: The Right to Sight recognised childhood blindness and low vision as one of the most important strategic themes in the control of avoidable blindness [3]. At least 80% of the world's visually impaired children live in low- and middle-income countries (LMICs), where less than 10% of them have access to education [4]. In terms of controlling childhood blindness and low vision, a multi-disciplinary approach is being adopted, with health education playing a key role [3].

Since 2000, the United Nations' Millennium Development Goals have laid emphasis on the need to promote child health and survival. Through health education children can become agents of change for health in their families and communities [5].

Education has the potential to change individuals' lives and fuel social transformation. There is a strong link between children's health, including their visual health, and the quality

of their learning and achievement at school. This, in turn, affects children's future quality of life and economic productivity. School eye health programmes provide a unique opportunity to deliver comprehensive eye health services to school-going children [6].

Despite the growing number of avenues for accessing health information [7], health knowledge and information gaps continue to manifest as myths and misconceptions, especially in many LMIC communities. For many people, the eye is a complex, delicate and poorly-understood organ, which only fuels such myths and misconceptions. These myths and misconceptions are often based on commonly-held beliefs, some of which have no scientific rationale and rarely bring benefit to eye health [8].

Naturally, parents are meant to be the first line source of eye health knowledge for the growing child. On a good note, Kumah et al., in cross sectional survey of mothers visiting a children's hospital in Ghana, found that maternal knowledge about childhood blindness was high. However, intervention modalities that focus on increasing the level of parental education, access to antenatal and postnatal care services, and promoting girl-child education should be promoted to help continually raise awareness and knowledge of childhood blindness [9].

A potential second line source of eye health knowledge is the school teachers of the school children. However, a study in Pakistan noted a significant gap among primary school teachers'



knowledge and practices related to students' eye health, particularly in low and medium income countries [10]. It is suggested that innovative strategies are needed to improve how teachers address students' eye health issues in the classroom.

Introducing health education in schools is essential as knowledge and good habits acquired at an early age are likely to persist. School eye health programs, when integrated into broader school health education and backed up by eye and child health services, can reach a large number of children and their families [11].

School eye health can encompass Health promotion and prevention to increase awareness among children and teachers, and to promote a healthy school environment. This can reduce the impact of local endemic eye diseases.

However, the education system remains the developing world's broadest channel for disseminating health knowledge, as well as developing health attitudes and practices [8]. It could therefore serve as an effective way of curtailing the influences of these myths and misconceptions on both pediatric and general eye care. As with all health education strategies, the starting point should be what the target audience already knows and does, and what they need to learn [12]. However, there is still a paucity of data on the views of children in most African communities on eye health and vision-related issues.

## Objectives

The objective of the study was to aid the effective promotion of pediatric eye care in these communities, and to eliminate the associated knowledge and information gaps. This research is important to family medicine practice, which cares for patients of all age groups and may be the first line of consultation for childhood eye disease. We studied the perceptions of Nigerian secondary school children on some prevailing eye-health myths, misconceptions and facts with the aim of developing and prioritizing appropriate eye health education messages for them. We also identified the myths and misconceptions that a significant proportion of the children considered to be true.

## Materials and methods

### Study design

The study was a cross-sectional survey.

### Study setting

To commemorate World Sight Day, the Department of Ophthalmology in the University of Nigeria Teaching Hospital (UNTH), Ituku Ozalla, Enugu conducted a 2-day free eye health screening/eye health education in selected secondary schools. Both schools are urban-based schools in the capital city of Enugu of Enugu State Nigeria, a private and a public government-run school.

### Study participants

The survey was simultaneously conducted among 833 pupils in the two randomly-selected schools on 9<sup>th</sup> and 10<sup>th</sup> October 2014.

A 29-item structured, single-response, pre-tested self-administered questionnaire was voluntarily completed by each pupil, after all relevant study information had been provided to the school in a briefing session. Findings from a literature search, Focus group discussions (FGDs) among non-medical hospital workers at UNTH, and also FGDs among school teachers in the city yielded the myths used to develop the questionnaire. Verbal informed consent was obtained from these respondents. Only consenting pupils were considered eligible for the study.

## Variables

Pupils were asked for their views on 25 perception statements presented as 22 myths/misconceptions and three facts; these related to daily living activities, use of spectacles, blindness/blinding eye diseases, and eye care. Possible responses were: "agree", "disagree" and "not sure". Eye health education in a question and answer format, which mainly addressed the 25 statements, was provided to the pupils at the end of the exercise.

## Data sources/management

The data were recorded in a written format in the questionnaires by the investigators.

## Statistical method

Data were entered into and analysed using the Statistical Package for Social Sciences (SPSS), version 18 (SPSS Inc., Chicago, Illinois, USA). Preliminary descriptive statistics were performed to yield frequencies, percentages and proportions. In the univariate analysis, a statistical test for the significance of observed between-group differences in knowledge status was performed using the chi-squared test for categorical variables and Student's *t*-test for continuous variables. For all comparisons, a *p* less than 0.05, at one degree of freedom, was considered statistically significant.

## Ethical approval

Prior to commencement of the study, ethical clearance compliant with the Declaration of Helsinki on research involving human subjects was obtained from the University of Nigeria Teaching Hospital (UNTH)'s Medical and Health Research Ethics Committee (Institutional Review Board). Furthermore, informed consent for participation was obtained from the teachers and from each study participant after the investigators' guarantee of anonymity of participation, confidentiality of responses, and the use of obtained data strictly for research purposes.

## Results

### Participants

The sample ( $n = 833$ ) comprised 404 males (48.5%) and 429 females (51.5%). The government-run public school contributed 715 pupils (M: 46.4%, F: 53.6%, response rate 70.2%) and the private school contributed 118 pupils (M: 61%, F: 39%, response rate 72.8%).

### Descriptive data

All respondents returned validly completed questionnaires. The age range was 10–17 years (median age group 13–14 years; IQR – 6); the mean (SD) ages were 14.28 (1.69) years and 13.58 (1.81) years for the public and private schools, respectively. Across the two schools, 639 (76.7%) and 194 (23.3%) pupils were in the senior secondary (SS) and junior secondary (JS) years, respectively.

### Main results

The majority of pupils 528 (63.4%) stated that they had never attended a health talk on the eyes/vision, and 34 (4.1%) could not remember. More pupils in the SS compared to the JS had listened to previous eye health talks ( $p = 0.031$ ). Table 1 shows the pupils' views on the 25 perception statements presented to them. More than half of the respondents (50.5–93.9%) agreed with 10 of the 22 statements presented as myths/misconcep-

**Table 1. Pupils' perception of statements related to vision in daily living activities, use of spectacles, blindness, eye diseases and eye care**

Perception statement	Agree (%)	Disagree (%)	Not sure (%)
Reading in dim light damages vision	756 (90.8)	38 (4.6)	39 (4.7)
Staying close to TVs damages vision	782 (93.9)	16 (1.9)	35 (4.2)
Looking into car headlights damages vision	604 (72.5)	96 (11.5)	133 (16)
Using a computer often damages vision	407 (48.9)	255 (30.6)	171 (20.5)
Using one's eyes too much damages vision	230 (27.6)	345 (41.4)	258 (31)
Reading in moving cars damages vision	235 (28.2)	358 (43)	240 (28.8)
Vision can be improved by eating certain food items	558 (67)	75 (9)	200 (24)
No harm in blowing off objects from other eyes	502 (60.3)	187 (22.4)	144 (17.3)
Wearing someone else's glasses will make one go blind	478 (57.4)	203 (24.4)	152 (18.2)
Wearing prescribed glasses will permanently cure the problem	421 (50.5)	266 (32)	146 (17.5)
Short-sightedness is worse than long-sightedness	238 (28.6)	170 (20.4)	425 (51)
Children below a certain age should not wear glasses	286 (34.3)	325 (39)	222 (26.7)
Use of glasses is evidence of impending blindness	170 (20.4)	546 (65.5)	117 (14.1)
Some cases of blindness are treatable	679 (81.5)	60 (7.2)	94 (11.3)
Some cases of blindness are preventable	730 (87.6)	42 (5)	61 (7.3)
Blind children should be in special schools, not regular ones	413 (49.6)	257 (30.8)	163 (19.6)
Society should not expect the blind child to excel in life	342 (41.1)	344 (41.3)	147 (17.6)
Most blindness cases and eye problems run in families	576 (69.2)	131 (15.7)	126 (15.1)
Cataracts, glaucoma and eye tumors occur only in adults	108 (13)	405 (48.6)	320 (38.4)
Crossed (lazy/deviated) eyes cannot be corrected	208 (25)	242 (29)	383 (46)
Normal eyes can be made whiter/brighter with eye drops	523 (62.8)	128 (15.4)	182 (21.8)
Saliva, palm wine and breast milk can be used as eye treatment	144 (17.3)	496 (59.5)	193 (23.2)
Eye donation after death is acceptable to treat others	213 (25.6)	377 (45.2)	243 (29.2)
Most eye surgeries are not successful	543 (65.2)	126 (15.1)	164 (19.7)
Children do not need regular eye checks	119 (14.3)	564 (67.7)	150 (18)

tions. A substantial majority (81.5–87.6%) agreed with two of the three statements presented as facts; however, a greater proportion, 377 (45.2%), disagreed with the third statement: "It is acceptable to donate one's eyes after death to help treat other living persons with some eye problems".

The most commonly-believed myths/misconceptions among respondents were "staying close to the television set will damage vision" 782 (93.9% agreed), followed by "reading in dim light will damage vision" 756 (90.8%) (Table 1). The least commonly-held myth/misconception is "one does not need regular eye checks till one gets old" (14.3% agreed, 18% not sure). The respondents were almost equally split in their responses to "society should not expect a blind child to excel in life". The pupils were least sure about "short-sightedness is worse than long-sightedness", 421 (50.5% not sure), and "crossed-eye disorders (deviated eyes/squints/lazy eyes) cannot be corrected in children", 383 (46%).

## Discussion

### Key results

This study has demonstrated the persistence of certain health myths and misconceptions among a significant proportion of secondary school children; a clear indicator of eye health knowledge and information gaps. These myths and misconceptions remain despite factual information being readily available on the internet. The majority of the 10 most common myths/misconceptions identified in this study are concerned with activities of daily life and the use of spectacles. This highlights the need to bridge knowledge and information gaps, particularly in these areas, in subsequent eye health education campaigns within this population group.

## Interpretation

With the advent of information technology and the increased use of TV, video games, computers and other visual display units by children, appropriate health information regarding viewing habits must be provided to dispel common beliefs about possible eye damage from using such devices at close range or for prolonged periods. There is no evidence to suggest that near-vision activities have a role in inducing poor vision, neither has the use of someone else's spectacles, though they may cause eye fatigue and strain. The inability of a child to view the TV from a distance may actually be as a result of poor vision rather than the converse, and may require detailed eye examination. In addition, young children tend to be attracted by the bright light and colours of screens, and may want to stay close to them. There is no known significant electromagnetic radiation emitted by modern TV/VDU screens that causes harm to vision.

In terms of looking directly into light as a cause of ocular damage, children can be told that looking into car headlights at night simply dazzles them temporarily rather than necessarily damaging vision in the long term. This is in contrast to looking directly at the sun, or welding without wearing proper eye protective devices. These points will need to be stressed when educating these pupils.

Regarding the use of spectacles, pupils need to be educated that although using someone else's spectacles may cause significant discomfort and eye strain, it does not necessarily cause blindness. In addition, there is a need to educate pupils that wearing spectacles for refractive errors only improves the focusing or resolving abilities of the eyeballs whilst worn: they are not a permanent cure. However, our results indicated that school children, at a minimum, understood that spectacles can be useful in improving some vision problems. In Nigeria, there is some

belief that children should not have eye problems and therefore should not wear spectacles. This may cause children with eye problems to be reluctant to seek help to avoid the associated stigma or teasing within the community. It is therefore important that appropriate information is provided to these children, as uncorrected refractive error remains an important cause of avoidable visual impairment [13].

Similar studies conducted among various population groups around the world have also demonstrated the existence of myths and misconceptions around the causes of poor vision or the use of spectacles [14–16]. Primary school children and teachers in Pakistan believed that watching TV from a close distance for prolonged periods, playing video games and reading in dim light were factors which may damage the eyes [14]. In Brazil, 95% of teachers surveyed in the Sao Paulo public school system believed that watching TV from close range could damage vision [15]. Even among health professionals in Brazil, misconceptions include believing that glasses could permanently cure refractive problems and that eye damage was due to reading in dim light and watching TV from close range [16].

Another commonly-held belief is that there is no harm in asking someone to blow foreign objects from the eyes. This seemingly innocuous practice may happen in the course of play at home or in school when agents such as pieces of vegetable matter, stones or dust enter the eyes. However, children do not understand that this practice risks eye injury from other foreign bodies or even saliva from the blower's mouth. This practice needs to be discouraged, and simple first-aid measures, such as washing the face with clean water, promoted instead. In the Pakistani study, some potentially harmful practices reported by the children were the use of certain types of Kohl (traditional remedy) and chillies in their self-treatment of eye injury [14]. Globally, eye injuries are responsible for a large proportion of disabling ocular morbidity in children, so health education remains a vital tool in prevention [17].

Children's perceptions on the use of eye drops to make normal eyes whiter/brighter, and eating certain food items to improve vision also needs some attention in future health education campaigns. In terms of eye colour, this belief may be connected to the idea that whiter eyes are healthier or more attractive, and that any discoloration is evidence of an eye problem. This finding was noted among children in Pakistan [14]. Normal eyes are not usually made whiter with the aid of drugs; however, certain drugs may be used in controlling inflammations and allergies, with the side effect of reducing redness. Regarding the health benefits of consuming certain foods, children should be educated that vision in normal people may not necessarily be improved by eating certain food items. However, good nutrition is a means of promoting eye health and protecting eyes from certain diseases: vitamin A deficiency is a notable example. Eye health education for these children should therefore include

messages on the normal eye and routine eye hygiene. This should also help to curtail the practice of self-medication.

Of serious importance to the campaign against avoidable blindness are the beliefs that most blindness/eye problems run in families, and that most eye surgeries are unsuccessful. Although some eye problems may be hereditary, many others may be due to infection, trauma, degeneration, poor nutrition or metabolism. Moreover, with the advances in micro-surgical techniques and technology, excellent visual outcomes are now much more common. In the same light, eye donations are being increasingly encouraged globally since corneal transplants are known to be effective if performed for the appropriate eye disorders and under optimal conditions [18]. Previous studies have found that the greatest potential barrier to developing eye banks is that segments of the populace hold incorrect or misinformed views about eye donation [19–24]. These need to be urgently addressed if any meaningful progress is to be made in controlling corneal blindness in Nigeria.

Children also need to be taught about blindness and common conditions such as cataracts, glaucoma, trauma, corneal disease, ocular tumors and squints, as well as the benefits and complications of eye surgery. In related studies carried out in Bangladesh and Africa [25–27] the levels of knowledge and practice towards childhood blindness prevention and red eye were poor. Once knowledge of eye surgery has increased, the use of these services by children and their families should grow over time.

### Limitations of the study

The conclusions from this study and the generalization of its findings are limited by the few schools surveyed, study specificity for secondary school students, and the questionable reliability inherent in self-reported knowledge surveys. Further qualitative research involving multiple schools and settings is required to provide greater insight into children's understanding of eye health.

### Conclusions

Despite the persistence of myths and misconceptions among school children, this study has also demonstrated that they generally have a relatively reasonable level of knowledge in terms of safe eye care practice. Appropriate eye health messages still need to be provided as part of the school eye health program to dispel these common myths and misconceptions. Health information leaflets and other educational materials can be adapted locally and distributed within all educational settings.

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