

Knowledge, attitude and practice on refractive error among students attending public high schools in Nairobi County

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ABSTRACT

Objective: To determine the Knowledge, Attitude and Practice (KAP) towards refractive error among high school students attending public schools in Nairobi, Kenya.

Methods: Population survey of secondary school year 3 students in Nairobi County. Students were selected using multistage random sampling. Sampled students were enrolled after obtaining informed consent. Participating students completed a self-administered semi structured questionnaire to obtain basic demographic data and determine their KAP towards refractive error.

Results: A total of 11 out of 80 eligible schools were selected and 1390 students enrolled into the study. The mean age of the students was 17 years, and 54% were males. Only 539 (39%) of the 1390 students had ever had an eye-checkup. Overall 418 (30.1%) of the students did not know whether they had normal vision or not, and 316 (22.7%) did not know where to seek eye-health services. The students believed, as reported by 526 (37.8%) students, that the most common reason for poor vision was inadequate nutrition. Spectacles were identified as the commonest method of correcting poor vision by 851 (61.2%) students. Of 427(30.7%) students who had been advised to wear spectacles during previous screenings, only 148 (10.5%) of them admitted to using spectacles. The commonest reasons for students failing to wear spectacles to correct poor vision were; fear of being teased and cost as reported by 529 (38.1%) and 488 (35.1%) students respectively. Generally, students had a positive attitude towards spectacles but the myths that spectacles can damage your eyes, lead to dependence, or worsen eyesight were still prevalent.

Conclusion: Accessibility and affordability of eye-health services are the major reasons for non-correction of low vision. There is also inadequate knowledge of refractive error as a cause of poor vision. However, attitudes towards spectacle use are generally positive.

Key words: Knowledge, Attitude, Practice, Refractive error

INTRODUCTION

Globally, uncorrected refractive errors are the main cause of moderate to severe visual impairment. Worldwide uncorrected refractive error has been estimated to account for more than half of the cause of visual impairment and 18.2% of blindness¹. Refractive error is easy to diagnose and correct using spectacles. Nevertheless, it is estimated that 77.3% of children in urban Kenya who have significant refractive error are uncorrected. In Nairobi, Kenya, uncorrected refractive error is also the main cause of visual impairment among teenagers².

The study population were senior high school students in Nairobi County, one year from matriculation. They are at the point of transition into adult life and independence. They have also completed the full cycle of organised schooling and assessing their knowledge, attitude and practice at this point may explain the low rates of correction found in earlier local studies.

Lack of knowledge, stigma and erroneous beliefs towards refractive errors has been shown to play a major role in uptake of refractive services in different continents.³⁻⁶ However in Kenya, the knowledge, attitude and practice towards refractive error is not known. The

factors that hinder eye health seeking behavior are also not known. Uncorrected refractive error has the huge potential of hindering school performance which may subsequently impact on the psychological and socioeconomic activities in later life⁷.

We chose this age group because youths are a relatively captive audience who can be targeted for important health services through school based programs which have been shown to be effective⁸. Screening for refractive errors and eye health education would be such a program.

This study sought to determine the Knowledge, Attitude and Practice (KAP) regarding refractive error among senior high school students schooling in Nairobi County. This information may in future be used to develop school based programs to address refractive error.

MATERIALS AND METHODS

In October 2014, we conducted a KAP survey among high school students enrolled in public schools in Nairobi County. A cross-sectional survey, form 3 high school students were proportionately sampled following a multi-stage random selection of the schools that took into account

the classification of the schools into National, County or District schools, and whether it was a day or a boarding secondary school. The schools were further stratified into boys schools, girls schools and mixed schools. The number of students sampled was based on the proportion of students in National, County and District schools in the study area as extracted from the Ministry of Education enrolment statistics⁹.

Ethical approval was obtained from University of Nairobi - Kenyatta National Hospital Research and Ethics Committee and from the Ministry of Education. Additional permission from individual school head teachers was obtained. Participating students gave individual assent after explanations on the goals of the study. The required minimum sample size was 1,297 students. This was derived from an estimated prevalence of 11% from an earlier study in the same area but different age group to achieve an accuracy of ± 0.02 in the measured prevalence. An additional 25% was factored into account for absenteeism and non-response.

Each participant completed a self-administered questionnaire to obtain demographic data and determine their Knowledge, Attitude and Practice (KAP) towards refractive error. Knowledge on the student's current status of vision, knowledge on causes of poor vision and accessibility of eye healthcare facilities was asked. Attitudes towards spectacle use were scored on a Likert scale (1=strongly disagree, 2 = disagree, 3=neutral, 4= agree and 5= strongly agree). These questions were modelled from earlier studies done in the same population². Poor vision was our entry point into asking about refractive error as inability to see (poor vision) was the symptom that students were most familiar with. The data was analysed using SPSS 20.0. The median Likert scale was computed and used to identify the majority opinion to questions regarding correction of refractive error using spectacles.

RESULTS

Demographic data: A total of 1,622 students were eligible for the study of whom 1,390 participated giving a response rate of 85.7% while 131 students were absent and

101 students declined. The mean age of the students was 17 years (Standard deviation= ± 1.04 , range 14-23 years). In this study population there were more males (54%) compared to females (46%) and this was statistically significant ($p < 0.01$). However the proportion of students who did not respond in regard to fathers education was higher at 287(20.6%) compared to the mother's education at 225(16.2%).

Knowledge regarding refractive error and barriers to spectacle use

Table 1 summarises the knowledge and practice of participants towards spectacle use and correction. The questions were grouped as follows;

Knowledge of current visual acuity: To test universality of healthcare reach students, were asked whether they ever had an eye checkup. Only 539 (39%) of students had been examined prior to this study. When the students were asked what they felt about their vision, only (35.3%) felt they had normal vision.

Knowledge on causes and remedies of poor vision: In response to the question on what were the causes of poor vision among students, 526 (37.8%) cited poor nutrition, 429 (30.9%) shortsightedness, 178 (12.8%) long-sightedness, and 111 (7.9%) astigmatism. However, most students (61.2 %) knew of spectacles as a method of correcting poor vision.

Accessibility of eye healthcare services: Overall 880 (63.3%) students knew where to access eye care and the most frequently identified facility was the eye hospital by 515 (37%) students. The 539 students who indicated that they had ever had an eye check-up were asked where they had sought care, most, 345/463(64%), responded they had received their check up from an eye specialist/eye hospital.

Table 1: Knowledge, Attitude and Practice of refractive error in secondary school students in Nairobi County

Total population (n=1390)

Knowledge of current visual acuity

Have you ever had an eye check up

Yes	539(39%)
No	829(60%)
No response	22(1%)

Do you feel you have normal vision

I don't know	418(30.1%)
I don't have normal vision	458(32.9%)
Yes I have normal vision	491(35.3%)
No response	23(1.7%)

Knowledge on causes and remedies of poor vision

What are the causes of poor vision among students

Short sightedness	429 (30.9%)
Long sightedness	178 (12.8%)
Poor nutrition	526 (37.8%)
Astigmatism	111 (7.9%)
Don't know	257 (18.4%)
No Response	128 (9.2%)

What methods of correcting poor vision do you know

Spectacles	851(61.2%)
Medicine	400(28.8%)
Contact lenses	365(26.2%)
Surgery	296(21.3%)
Don't know	28(2.0%)
No response	30(2.2%)

Accessibility of eye healthcare providers

Do you know where to seek help if you have poor eye sight? (n=1390)

Yes	880(63.3%)
No	316(22.7%)
No response	194(13.8%)

Where did you have you eye check-up? (where students who had had an eye check-up went n=463/539)

Optic shop	155(11.1%)	87(16.1%)
General hospital	236(16.9%)	110(20.4%)
Eye hospital	515(37.0%)	345(64.0%)

Barriers to spectacle use 76(14.1%)

Have you ever been advised to wear spectacles(n=1390)

Yes	427(30.7%)
No	867(62.4%)
No response	96(6.9%)

Do you use spectacles? (n=1390)

Yes	148 (10.5%)
No	1210 (87.1%)
No response	32 (2.4%)

Do you have your spectacles? (n=427)

Yes	170(39.8%)
No	245(57.4%)
No response	12(2.8%)

How often do you wear your spectacles? (n=170)

All the time	76(45%)
Sometimes	90(55%)
No response	4(2.4%)

Why students been advised to wear spectacles don't have/don't wear them? (n=245)*

Expensive	124(50.6%)
No difference in vision	118(48.2%)
Makes vision worse	35(14.3%)
Fear of being teased	25(10.2%)
Broken or lost	4(1.6%)

What are some of the reasons students with poor vision do not wear spectacles? (n=1390)*

Cost	488(35.1%)
Cosmetically unacceptable and embarrassing in public	149(10.7%)
Spectacle prevent normalization of eye sight	334(24.0%)
Fear of being teased	529(38.1%)
Don't know	51(3.7%)

Alternatives to spectacles in correction of visual defects

Would you prefer another way to correct vision? (students with spectacles) (n=170)

(Prefer another way to correct vision) Yes	123 (72.3%)
(Do not prefer another way to correct vision) No	37 (21.8%)
No response	10 (5.9%)

What method would you prefer? (for only those who said yes, prefer another way to correct vision) (n=123)

Contact lenses	83 (69.1%)
Surgery	37 (31.7%)
No response	3 (2.4%)

Barriers to correction of low vision

Access to spectacles: To gain insight about the use of spectacles as the main modality of correcting visual defects, students were asked whether they had ever been advised, by a health practitioner, to wear spectacles. Overall 30.7% (427/1390) had been advised to wear spectacles while 62.4% (867/1390) had not. In response to a direct question on 'do you use spectacles', 148 (10.5%) of the 1390 students indicated that they use spectacles. This shows that 279 (65.3%) of the 427 students who knew that they needed spectacles were not using them. A further question on whether they had a pair of spectacles, 170 (39.8%) of the 427 needing one said they had their spectacles with them. This represents 257 (60%) of the students who needed a pair of spectacles but did not have one.

Adherence to spectacles use: On being questioned on the frequency of wearing the spectacles, only 45% (76/170) with spectacles wore them all the time, with 55% (90/170 students) wearing them sometimes. Thus, only 76 (16.1%) of the 427 students who needed spectacles had correction for their refractive error all the time.

Barriers to use of spectacles: When we enquired from all the study participants reasons students with poor vision did not wear spectacles, 529 (38.1%) of 1390 said they feared being teased, 488 (35.1%) thought cost was the barrier. A sub-analysis was carried out among the 245 of 427 students who had been advised to use spectacles and who did not own a pair or did not wear one. The reasons for not using the spectacles was that they were expensive as reported by 124 (50.6%) of 245 students, 118 (48.2%) felt that the spectacles did not make much difference in vision, another 35 (14.3%) felt that they worsened the vision while 25 (10.2%) feared being teased. Four (1.6%) students reported that the spectacles were either lost or broken.

Attitudes towards spectacle use: As summarized in Figure 1, attitudes towards spectacle use were investigated to detect psychological barriers towards correction. The median score was used to identify the majority opinion to a number of questions. The study participants were of the opinion that refractive error should be corrected. On the question as to whether young people do not need spectacles, more than half of the students strongly disagreed or disagreed with the statement (median score-2), showing an appreciation that young people can also require spectacles for correction of refractive error.

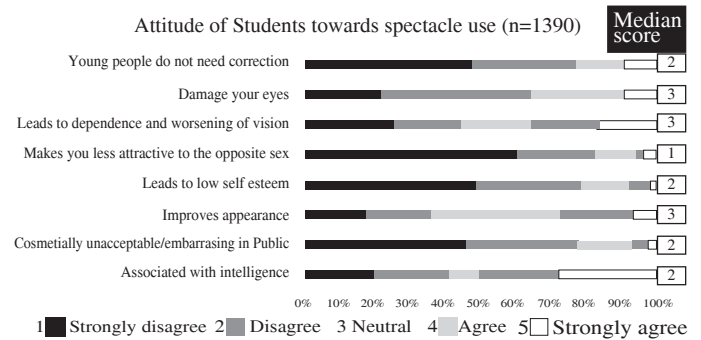


Figure 1: Attitude of students towards spectacle use

Student opinion was divided on two questions assessing the detrimental effect of spectacles, that is 'do spectacles damage your eyes' and 'do spectacles lead to dependence and worsening of eyesight'. The median score to both this questions was 3, or neutral, with roughly half the students agreeing to the statements and the other half disagreeing.

Attitudes towards the effect of spectacles on the outward appearance of the wearer were assessed. Students strongly disagreed (median score-1) wearing spectacles makes you less attractive to members of the opposite sex and they disagreed (median score 2) spectacles are cosmetically unacceptable and embarrassing in public. However, they were neutral (median score-3) as to whether spectacles improve appearance. Students were asked on possible inward effects of spectacles. They disagreed to the statements that spectacles lead to low self-esteem and wearing spectacles is associated with intelligence with median Likert score= 2 each.

Alternatives to spectacles in correction of visual defects: As shown in Table 1 students were assessed on their receptiveness to alternative methods of correcting visual defects other than spectacles. Students who were currently using spectacles (n=170) were asked whether they preferred an alternative to correcting vision and 72.3% (n=123) replied in the affirmative, while 21.8% were comfortable with spectacles as their primary method of correcting poor vision. Of the methods, 69.1% preferred contact lenses, while 31.7% preferred surgery done to correct their poor vision.

DISCUSSION

The objectives of this study were to determine knowledge, attitude, and practice of refractive error in adolescent boys and girls a year before completion of their high school education. The most significant finding in this population was that only 39% of students had ever had an eye check-up and one in four students did not know whether

or not they had normal vision. Prevalence of refractive error ranges between 4.7%-80% with wide geographic variability and low coverage of screening services even in developed nations, similar to our own findings¹⁰⁻²⁷. These studies show that there is need for universal eye screening in school going children. In most settings there is a dearth of skilled ophthalmology personnel which can be overcome by task-shifting screening to pre-trained school nurses, school teachers and students. Evaluation of this approach has shown that lay staff achieve acceptable validity in picking up refractive errors²⁸⁻³¹.

Knowledge of eye disease is a curriculum requirement in the Kenyan educational system, and therefore most students could identify the causes of poor vision from a list. However a large majority (37%), attributed wrongly poor nutrition being a major cause of visual impairment, perhaps reflecting the myth that carrots can help one avoid glasses or the tenuous food security that these students and their families face. Thus there was little knowledge among high school students of refractive error as a cause of poor vision despite of it being the major cause of poor vision in this age group. Possibly, the curriculum has not been updated to reflect refractive error as the major cause of poor vision in this age group. The inclusion of regular vitamin A supplementation to vulnerable populations has reduced poor nutrition as a cause of visual impairment³²⁻³⁴.

Spectacles were the most well-known method for correcting visual defects. One third of the students had been advised to wear spectacles after previous encounters with eye healthcare professionals. A major finding was that only 17% (76/427) of the students with diagnosed refractive error were visually corrected all the time. This was because, 60% of students needing spectacles, did not own a pair and therefore were not using them. Half of these students, who did not own a pair of spectacles, said that the cost was prohibitive and this is similar to other studies in more affluent societies³⁵. Another reason stated, was that spectacles did not improve vision and some reported it made their vision worse. In this study half of the students who had spectacles prescribed and did not wear them, experienced no improvement in vision. This might have been due to incorrect prescription or non-deserving children being given glasses.

In addition to the low refractive error correction rate, was low adherence to the prescription with < 50% of the students who had a pair of spectacles using them all the time. Poor adherence to treatment is a well-documented phenomena among adolescents living with chronic disease. Mid adolescence (age 15-17 years) maybe characterized by feelings of invincibility leading to increased risk taking behaviour³⁶. In this instance the students and their parents were under-rating the effect of refractive errors on the academic performance even though the end of high school exams in Kenya undoubtedly determines your future social status and ability to meet the basic needs of living.

There is a growing trend to question traditional management of myopia amongst ophthalmologists as it has been shown to worsen myopia in teenagers. Management

of myopia in teenagers is now focused on prevention of myopic shift with orthokeratoplasty at the forefront of new technology. This mixed messages regarding management of myopia, which can be found in various print media affects adherence to spectacles³⁷⁻⁴². Some studies have found that improving knowledge around refractive error may increase the rates of correction⁴³. Nevertheless there is a higher rate of correction of refractive errors in this population compared to previous studies².

The quality of refraction may also have contributed to the poor adherence to spectacles. Half of students, who had been advised to wear spectacles, had found no difference in their vision while 14% reported worsened vision. It is not possible to validate these observations of worsening eye sight using this cross-sectional study design. In this study, we did not find out in detail where the spectacles were procured and therefore we do not know the extent this was a contributing factor to non-adherence. Improved refractive services may have a large impact in uptake of spectacles for correction of refractive error in this population since some could afford spectacles. It should be emphasized that students with refractive error should not generally expect improvement of their vision without intervention as the cause is of a physical nature⁴⁴.

Adolescence is a stage where conforming to the group is the norm, and wearing spectacles maybe a source of teasing. However, only one in ten students who had been advised to wear spectacles identified this as a major factor preventing them from taking up spectacles. When compared to similar populations, the students in Nairobi, Kenya were generally less averse to negative peer pressure. Most students perceived spectacles positively, did not have an adverse effect on the image of the user, enhanced a scholarly look making the user seem more intelligent while others insisted they made one more attractive to the opposite sex. This positive attitudes could be attributed to the growing trend of spectacles among celebrities popular to this age group. On the downside, the positive views on spectacles use were not shared by spectacle users with majority preferring contact lenses.

CONCLUSION AND RECOMMENDATION

The study has shown that high school students have limited access to refraction, and among those diagnosed with a refractive error there is limited access to the treatment because of the high cost of spectacles and poor attitude and knowledge on the effectiveness of refractive error. There is enough information in this survey to justify further investment into strengthening of refractive error screening into the school health program. There is need for further studies to better document the challenges students with refractive errors are facing and to develop adherence support services for students with refractive errors.

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