Knowledge, Attitude And Practice Of Ethiopian Paediatricians On Childhood Eye Diseases

Tolosa Tufa Regassa (✉ tolasatu89@gmail.com)
Jimma University College of Public Health and Medical Sciences

Aemero Abateneh Mengesha
Jimma University College of Public Health and Medical Sciences

Kumale Tolesa Daba
Jimma University College of Public Health and Medical Sciences

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Abstract

Background: Eye examination and vision assessment are vital for the detection of conditions that result in blindness. Childhood blindness has serious impact on development, education and future employment opportunities for the affected child. Pediatrion’s knowledge about eye disease is important in preventing blindness by early diagnosis, proper treatment and identifying conditions requiring referral to the ophthalmologist to preserve or restore vision. The aim of this study was to assess knowledge, attitude and practice of Ethiopian pediatricians’ on childhood eye diseases.

Methods: A cross-sectional descriptive study was done on 79 pediatricians working in various hospitals and clinics in Ethiopia. Participants were determined using convenient sampling technique. Data was collected using both closed and opened ended semi-structured questionnaires. Their responses were entered into EpiData 3.1 and transferred to Statistical Package for the Social Sciences (SPSS) version 21.0 software for analysis.

Results: The ndings of the study showed that participants in this study had positive attitude (94.9%) towards childhood eye diseases, even though this was not reected in actual knowledge and practice. Poor knowledge and low practice in the context of positive attitude may be due to various barriers like inadequate training during undergraduate, lack ophthalmology attachment during pediatric residency and unavailability of ophthalmic equipment.

Conclusions: Participants’ attitude towards childhood eye disease was positive, but their knowledge of eye diseases made their practice poor.

Background

Vision is an important sensory channel for the early development of attention and is likely to provide a unifying mechanism through which the information perceived through different sensory modalities can be organized and related(1). As a result, detecting visually impaired child and allowing getting correct and on time treatment has importance on child’s growth and development.

It was estimated in 2010 that there are 19 million children (age 0–14) globally with visual impairment (VI) of whom 1.4 million were irreversibly blind(2). The causes of blindness in children vary widely from region to region, reflecting socioeconomic development, cultural practices, coverage of preventive measures (e.g. measles immunization), and access to appropriate eye care and optical services(3, 4). Corneal scarring due to vitamin A deficiency, measles infection, ophthalmia neonatorum, and the effects of harmful traditional eye remedies are the most common causes of VI in developing countries whereas cortical visual impairment (CVI), retinal disorders (including ROP), and disorders of the optic nerve are the main causes in developed countries. Retinopathy of prematurity (ROP) is an important cause of VI in children in middle-income countries and in urban centers of developing countries(4–8).
A blind child is more likely to live in socioeconomic deprivation, to be more frequently hospitalized during childhood and to die in childhood than a child not living with blindness. Of those who are blind, two-third lives in developing countries and up to 60% of such children die within 1 year of becoming blind(9, 10).

Eye problems in Ethiopia are among the major public health challenges of the country and pose huge economic and social impact for affected individuals and to the society and the nation at large. Childhood blindness in Ethiopia is a considerable public health challenges which accounts for over 6% of the total blindness burden. A sight or life threatening ocular disorders, such as congenital cataract, corneal blindness, mainly as the result of measles and vitamin A deficiency, congenital eye anomalies, retinoblastoma and glaucoma, are common ocular morbidity in Ethiopia(11, 12). Many of the causes are either preventable or treatable with early diagnosis and treatment. Pediatricians play an important role in preventing blindness in children through routine vision screening, routinely performed at well child visits. Nevertheless, early detection and appropriate referral to an ophthalmologist largely depends on the pediatrician’s knowledge, attitude and practice.

Study done to assess practices, attitudes, and perceived barriers toward pediatric vision screening among national pediatrician, the majority of respondents (67%) indicated that they did not begin formal visual acuity testing until age 3 or over. The most commonly reported barriers to screening were inadequate training (48%), time required for exam (42%)(13). A survey carried out in the state of Illinois USA by John and Sharon on compliance with requirement of vision 0screening by pediatricians showed that 60% of pediatricians tested visual acuity in children aged 5 years and above, while half of this group tested children 2 to 4 years old. The most common reasons for not testing visual acuity were inadequate time (42%), children too young (18%), or that screening would be done at school (18%)(14). Another survey on preschool vision screening in pediatric practice was conducted by Alex R. Kemper et al where a national sample of pediatricians was surveyed to evaluate preschool vision screening practices. The rate of acuity screening for 3-year-old children was low (35%), but increased for 4- (73%) and 5-year-old children (66%). Common barriers to vision screening were that screening is too time-consuming (49%) and children are uncooperative (23%). In the same survey few pediatricians (3%) reported that screening is unnecessary because vision problems would be identified elsewhere (e.g., by the family)(15). A study done by Situma Peter Wanyama on Knowledge, attitude and practice (KAPs) of eye diseases in children among pediatricians in Kenya showed that 69.6% of participants had poor knowledge about eye diseases in children. Of the 69.6% of participants reported doing eye examination in children, only 43.5% do it as a routine part of every child's examination. The reasons reported by those who don't do eye examination (30.4%) were lack of enough time to do examination (39.5%) and not knowing how to do eye examination (31.6%)(16). Currently there is inadequate distribution of ophthalmologists and eye care worker in the regions of the country compared to pediatricians. In spite of the prominent role of pediatricians in prevention of childhood blindness, KAPs of these populations about childhood eye disease is not known in Ethiopia. Therefore, this study was conducted to assess the KAPs of Ethiopian pediatrician on childhood ocular illness.
Methods

This cross sectional descriptive study was done on 79 pediatricians working in various hospitals and clinics in Ethiopia using convenience sampling after ethical clearance was obtained from the Ethical Review Committee of Jimma University. Data was collected using both closed and opened ended structured questionnaire during Ethiopian Pediatric Society (EPS) annual conference held on February 6–8, 2019 after adequate orientation was given for all data collectors. The study participants were informed about the study and requested to sign a written consent. Only those study participants who were agreed and signed the informed consent were included. The collected data was checked for completeness, coded and entered into EpiData version 3.1 and exported to SPSS version 21. For descriptive statistics; frequency, percentage, mean, range and standard deviation were used. The overall KAPs of the study participants were analyzed in details and presented by using tables. The Chi-square test was used to test the association between different variables and a P-value of < 0.05 was interpreted as statistically significant.

Categorization of participants’ knowledge and practice was according to bloom's cut off points into good (> 80%), moderate (60–80%) and poor (< 60%). The sections assessing attitude of the respondents regarding childhood eye diseases was categorized into positive statements and negative statements by using Likert’s scale. The scores were vary from 11–55 and all individual answers were summed up for total scores. The scores were classified into 3 levels:

Positive attitudes 44–55 scores (80%-100%); Neutral attitudes 33–43 scores (60%-80%) and Negative attitudes < 33 scores (< 60%).

The following operational definitions were used in this study:

Children

Those under 16 years of age (UNICEF)

Blind years - is the number of years a person lives with blindness

Knowledge – what eye disease pediatrician know in children

Attitudes – how pediatricians feel and believe regarding eye disease in children

Practice - The actions intended to do in order to prevent blindness in children

Results

Of the total of 123 pediatricians who were contacted and reminded 79 returned complete answers, a response rate of 64.22%. The respondents included 45 males (57.0%) and 34 females (43.0%). The mean age was 37.82 (SD 9.80) years, range 26–66 years. The mean duration of practice were 8.24 (SD 8.2)
years, range 1–33 years. A majority were government practice (72.15%) and currently practicing in specialized hospital (70.88%).

Table 6.1
Background Characteristics of Participants (n = 79).

| Characteristics | Variables                        | N (%)   |
|-----------------|----------------------------------|---------|
| Sex             | Female                           | 34 (43.0) |
|                 | Male                             | 45 (57.0) |
| Age in years    | 21–30                            | 27 (34.2) |
|                 | 31–40                            | 24 (30.4) |
|                 | 41–50                            | 26 (32.9) |
|                 | 51–60                            | 2 (2.5)   |
| Duration of practice in years | 1–10                            | 54 (68.4) |
|                 | 11–20                            | 20 (25.3) |
|                 | 21–30                            | 1 (1.3)   |
|                 | >30                              | 4 (5.1)   |
| Type of practice| Government                       | 57 (72.2) |
|                 | Private practice                 | 17 (21.5) |
|                 | NGO                              | 5 (6.3)   |
| Place of practice| Specialized hospital             | 56 (70.9) |
|                 | General hospital                 | 20 (25.3) |
|                 | Primary hospital                 | 3 (3.8)   |
| Duration of Undergraduate Ophthalmology course attachment | 2weeks | 25 (31.6) |
|                 | 3weeks                           | 15 (19.0) |
|                 | 4weeks                           | 17 (21.5) |
|                 | 5weeks                           | 8 (10.0)  |
|                 | 6weeks                           | 12 (15.2) |
|                 | Not sure                         | 2 (2.5)   |
| Duration of postgraduate Ophthalmology training | 2weeks | 2 (2.5) |
| Characteristics | Variables | N (%) |
|-----------------|-----------|-------|
| Do you know any sign of poor vision in child? (n = 79) | No | 63 (79.75) |
| | Yes | 16 (20.25) |
| | Poor school performance | 12 (15.2) |
| | Nystagmus | 2 (2.5) |
| | Frequent eye rubbing or blinking | 1 (1.3) |
| | Tilted head to one side | 1 (1.3) |
| Knowledge of pediatrician on WHO definition of blindness (n = 79) | V/A < 3/60 | 25 (31.6) |
| | No light perception | 20 (25.3) |
| | I don't know | 22 (27.8) |
| | VA < 6/60, but >= 3/60 | 12 (15.2) |
| Knowledge on ocular signs of vitamin A deficiency (n = 79) | Bitot's spot | 66 (83.54) |
| | Ocular xerosis | 63 (79.74) |
| | Keratomalacia | 63 (79.74) |
| | Night blindness | 19 (24.05) |
| Knowledge on causes of leukocoria in children (n = 79) | Retinoblastoma(RB) | 76 (96.20) |
| | Cataract | 57 (72.15) |
| | ROP | 40 (50.63) |
| | Retinal detachment | 17 (21.52) |
| When to refer a child with leukocoria (n = 79) | Immediately | 79 (100.0) |
| Is refractive error correctable (n = 79) | Yes | 76 (96.2) |
| | I don't know | 3 (3.8) |
| Ways of refractive error correction (n = 79) | Spectacle | 65 (82.28) |
| | Surgery | 39 (49.67) |
| | Contact lens | 38 (48.10) |
| What are systemic illnesses in children associated with congenital cataracts (n = 79) | TORCH | 74 (93.67) |

*There was possibility of listing multiple responses in open ended in questions.*
| Characteristics                                      | Variables                        | N (%)     |
|------------------------------------------------------|----------------------------------|-----------|
| Do you know retinopathy of prematurity? (n = 79)      | Metabolic disorder               | 20 (25.31)|
|                                                      | I don’t know                     | 2 (2.5)   |
|                                                      | Yes                              | 77 (97.67)|
|                                                      | No                               | 2 (2.5)   |
| What is the time of screening retinopathy of prematurity? (n = 79) | 4–6 weeks                       | 67 (84.8) |
|                                                      | I don’t know                     | 7 (8.9)   |
|                                                      | 6–12 months                      | 5 (6.3)   |
| Knowledge on presentation of congenital glaucoma (n = 79) | Skipped the question             | 55 (69.6) |
|                                                      | Buphthalmos(big eye)             | 14 (18.99)|
|                                                      | Lacrimation                      | 13 (16.45)|
|                                                      | Fear of light                    | 5 (6.32)  |
| Knowledge on complication of squint in children (n = 79) | Loss of depth perception        | 76 (96.20)|
|                                                      | Lazy eye                         | 72 (91.13)|
|                                                      | Social stigma                    | 46 (58.22)|
| Causes of tearing in infant (n = 79)                  | Conjunctivitis                   | 55 (69.62)|
|                                                      | NLDO                             | 46 (58.28)|
|                                                      | Congenital glaucoma              | 27 (34.18)|
|                                                      | Skipped the questions             | 6 (7.6)   |
|                                                      | Foreign body                     | 1 (1.3)   |
| Knowledge on presenting signs retinoblastoma (n = 79) | Leukocoria                       | 56 (70.88)|
|                                                      | Proptosis                        | 45 (57.0) |
|                                                      | Skipped the questions             | 8 (10.1)  |
|                                                      | Squint                           | 3 (3.8)   |
| Treatment of retinoblastoma (n = 79)                  | Surgery                          | 74 (93.67)|
|                                                      | Chemotherapy                     | 70 (88.60)|
|                                                      | Radiation therapy                | 28 (35.44)|
|                                                      | Not treatable                    | 2 (2.5)   |

*There was possibility of listing multiple responses in open ended questions.*
Among respondents pediatrician, 63 (79.25%) of them didn't know signs of poor vision in children while 16 (20.25%) of them said yes to the questions. Poor school performance is the most mentioned 12 (15.2%) signs of poor vision. Only 25 (31.6%) knew correctly the definition of blindness according to WHO. Most of the pediatrician mentioned more than one ocular signs of vitamin A deficiency. Bitot's spot (83.54%), Xerosis (79.74%), and keratomalacia (79.74%) were the most mentioned signs of vitamin A deficiency.

Seventy six (96.2%) of pediatrician knew that refractive error is correctable and 65 (82.28%) responded that refractive error can be corrected by spectacle, 39 (49.6%) by contact lens and 38 (48.10%) by surgery. Majority 57 (74.0%) of respondents mentioned TORCH infection as a systemic illness in children associated with cataracts even if it's not specific.

Seventy seven (97.5%) of respondents knew retinopathy prematurity and 67 (84.8%) said that the time of screening for ROP was 4-6 weeks. Fifty five (69.6%) of the respondent didn't list (don't know) presentation of congenital glaucoma. Fifty five (69.62%) and 46 (58.28%) of respondents mentioned conjunctivitis and NLDO respectively as the causes of tearing in infant.

Knowledge on presenting signs of retinoblastoma, 56 (70.88%) mentioned leukocoria and 45 (57.0%) answered proptosis. On treatment of retinoblastoma, 93.67% and 88.60% of respondent listed surgery and chemotherapy respectively. Table 6.2 above shows that the knowledge score of the majority respondents were below 60% (classify as low level of knowledge).
Table 6.3
Practices of treatment and referral of various eye diseases in children

| Variable | N (%) |
|----------|-------|
| Do you do eye examination in children? (n = 79) |       |
| Yes | 68(86.1) |
| No | 11(13.9) |
| How frequently do you perform eye examination? (n = 68) |       |
| At every visit | 29(36.7) |
| When I see eye problem | 21(26.6) |
| When caregiver complain | 18(22.8) |
| Which test do you do usually? (n = 68) |       |
| Pupillary response | 59 (74.45) |
| Ocular motility | 39 (49.37) |
| Visual acuity | 31 (39.24) |
| Fundus examination | 1 (1.3) |
| What is/are reason not to do eye examination (n = 11) |     |
| Not adequately trained | 5 (6.3) |
| Not my responsibility | 1 (1.3) |
| Time consuming | 1 (1.3) |
| Difficult (i.e. children uncooperative) | 2 (2.5) |
| I do not know how to examine | 2 (2.5) |
| How do you manage children with red eye (n = 79) |       |
| Give eye drops and refer if no improvement | 39 (49.4) |
| Give eye drops | 29 (36.7) |
| Give eye drops and refer immediately | 6 (7.6) |
| Refer immediately | 5 (6.3) |
| What do you do for child with squints? (n = 79) |       |
| Refer immediately to eye care worker | 74 (93.7) |
| Follow up and refer if it doesn’t resolve | 5 (6.3) |
| What do you do for the child you suspect retinoblastoma? (n = 79) |       |
| Immediately refer to eye care center | 59 (74.7) |
| Order CT-scan | 17 (21.5) |
| Order B-scan ultrasonography | 3 (3.8) |
| Variable                                                                 | N (%)                      |
|------------------------------------------------------------------------|----------------------------|
| What do you do for a child with congenital cataract? \(n = 79\)        | 79 (100.0)                 |
| What do you do with the child you might suspect congenital glaucoma? \(n = 79\) | 77 (97.5)                 |
| Give eye drops and follow                                              | 2 (2.5)                   |
| What do you do for a child with congenital tearing? \(n = 79\)        | 47 (59.5)                  |
| Observation                                                            | 23 (29.1)                 |
| Reassure the family                                                   | 6 (7.6)                   |
| Give eye drop and send home                                           | 3 (3.8)                   |

From these result, 68(86.1%) of respondents said they do eye examination, only 36.7% do eye examination in children as routine. Majority (74.45%) of the respondent do pupillary examination while the most cited reason for not examining was not adequately trained (6.3%). Practice on red eye in children about half (49.4%) of pediatrician give eye drops and refer if no improvement. Seventy four (93.7%) of respondent immediately refer a child with squint while 74.7% said immediately refer a child they suspect of retinoblastoma to eye care workers. With a child congenital cataract and suspect of congenital glaucoma referral was nearly 100%.

| Category                 | Frequency | Percentage |
|--------------------------|-----------|------------|
| Positive attitudes       | 75        | 94.9%      |
| Neutral attitude         | 4         | 5.1%       |
| Total                    | 79        | 100.0%     |

Table 6.5 show among the respondents’ pediatricians, 94.9% had positive attitude against childhood eye diseases.

**Discussions**

Among respondents pediatrician, 63(79.75%) of them didn’t know signs of poor vision in children while poor school performance was mentioned by 12(15.2%) which may be late signs of poor vision. This may be explained by inadequate undergraduate ophthalmology course time as majority of participants took it for only 2weeks and absence of ophthalmology attachment during residency. The study found that 68.4% of respondents’ pediatricians didn’t know the WHO definition of blindness. As to the Authors’ knowledge there were limited study done on this area to compare with. Most of the pediatrician mentioned more than
one ocular signs of vitamin A deficiency. Bitot's spot (83.54%), xerosis (79.74%), and keratomalacia (79.74%) in a moderate level of knowledge. This could be due to the fact that vitamin A deficiency is common problem in pediatric practice.

Knowledge on retinoblastoma as a cause of leukocoria was good (96.20%). Knowledge on cataract and ROP as causes of leukocoria was moderate (72.15%) and poor (5.65%) respectively. Our finding was comparable with the report of study done in Kenya, 90.60% of the respondents mentioned retinoblastoma and 74.36% mentioned cataract as causes of leukocoria(16). On Knowledge of systemic illnesses associated with congenital cataract, majority of participants (93.67%) mentioned TORCH infection, diabetes (25.31%) which was similar with study done in Kenya (94.11% and 28.75%) respectively.

Knowledge on presentation of congenital glaucoma showed that the participants had poor knowledge since 69.6% of participants skipped the question. Among the signs mentioned included big eye by 8.9% as compared to 36.89% of study done in Kenya(16). This lower proportion could be attributed to rare health seeking of such child as this eye considered as beauty eye in our society. Knowledge on causes of tearing in infant revealed that pediatrician has poor knowledge since mean score of knowledge is 40.88%. To the Author's knowledge there were limited study done on this area to compare with. On presenting signs of retinoblastoma, our study showed 70.88% of the respondents mentioned leukocoria (86.07% in Kenya), 57.0% proptosis (54.10% in Kenya). Majority of the respondents mentioned surgery and chemotherapy (93.67% and 88.6%) respectively as treatment modality of retinoblastoma which was in good knowledge level. In study done in Kenya, 94.40% of respondents knew that retinoblastoma is treatable disease which was comparable.

With regard to Ethiopian pediatricians practice on childhood ocular illness, 86.10% of participants reported doing eye examination in children of which only 36.7% do it as a routine part of every child’s visit. The most common test performed in our study was pupillary response (74.45%). But in other study, visual acuity testing was most commonly performed test on children (14.16). This could be possibly because of unavailability of visual acuity chart in most of pediatric department The most common reasons cited by those who reported they don’t do eye examination (13.90%) were not adequately trained. On practice of retinoblastoma suspicious 74.7% of respondents said that they immediately refer to ophthalmologist. The others 21.5% order CT-scan and 3.8% order ultrasonography. It needs further study on this particular question what characteristics suggest retinoblastoma on those imaging modalities.

The findings of our study showed that participants in this study had positive attitude (94.9%) towards childhood eye diseases (it was compared to study done in Kenya)(16). Logistic regression assessing the association between the attitudes and socio-demographic factors had no statistically significant association with attitude against childhood eye disease.

**Conclusion**

In conclusion, the study demonstrated that even though the pediatrician had actual poor knowledge and low practice, they had high level of interest to improve their knowledge and practice on childhood eye
diseases like diagnosing and managing ophthalmic problems, uses of ophthalmic medication and simple diagnostic instruments. Therefore, pediatrics and child health departments’ needs to include pediatrics ophthalmology course attachment in to residency curriculum. In addition, the institution should make available important ophthalmic equipment such as visual acuity chart and direct ophthalmoscopy.

**Strength and limitation of the study**

This study is the first to evaluate the knowledge, practices and attitudes toward eye diseases in children among pediatrician in Ethiopia. We addressed a previously neglected issue to find ways in overcoming of childhood blindness that challenge developing world including Ethiopia

Our study was not without limitation. These limitations included: Many unanswered questions, especially the open-ended questions which were difficult to analysis and interpret, and a few published studies on this specific topic with which to compare the findings and give conclusion.

**Abbreviations**

EPS
Ethiopian Pediatrics Society; KAP: knowledge, attitude and practice; NLDO: Naso-Lacrimal Duct Obstruction; RB: Retinoblastoma; ROP: Retinopathy of Prematurity; SPSS: Statistical Package for the Social Sciences; TORCHES: Toxoplasmosis Rubella cytomegalovirus Herpes simplex Syphilis; UNICEF: The United Nations Children's Fund; VA: Visual Acuity; VI: Visual Impairment; W.H.O: World Health Organization.

**Declarations**

We declare that the information provided in the following sections of the manuscript was written based on our consensus.

**Ethics approval and consent to participate**

Ethical clearance was obtained from the Ethical Review Committee of Jimma University. Participation in the study was based on a written informed consent from each participant.

**Consent for publication**

Not applicable

**Availability of data and material**

Not applicable

**Competing interests**
The authors declare that they have no competing interests related to the publication of this manuscript.

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**Authors' contributions**

TT designed the study, collected data, and conducted the analysis, interpretation, report writing and write up of the manuscript. AA assisted in the design of the study, data interpretation and critically reviewed the manuscript. KT assisted in the design of the study, data interpretation and critically reviewed the manuscript. All authors read and approved the final manuscript.

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