# KNOWLEDGE, ATTITUDES AND PRACTICES OF PAEDIATRICIANS ON THE MANAGEMENT OF CHILDHOOD EYE DISEASES IN GHANA

**Bonsaana GB[1,2]; Yakubu RC[1]; Wanyama PS[3]; Nuertey BD[1]**

[1]Tamale Teaching Hospital, Tamale, Ghana; [2]Department of Ophthalmology, School of Medicine, University for Development Studies, Tamale, Ghana; [3]Kapenguria District Hospital, West Pokot County, Kenya.

## Abstract

***Objective:*** To explore the knowledge, attitudes and practices of paediatricians on the management of eye diseases among children in Ghana.

***Methodology:*** This was a mixed model study, both quantitative and qualitative methods were employed among paediatricians practicing in hospitals across Ghana who consented to the study. Consecutive sampling was used to select participants. Self-administered, semi-structured questionnaires, in-depth interviews and focused group discussions were used to collect relevant data. Analysis was carried out with STATA version 14.

***Results:*** More than half (53, 60.2%) of Paediatricians practicing in Ghana had good knowledge of childhood eye diseases. Although almost all (89, 98.9%) paediatricians disagreed with the statement that 'eye examination in children should be done only when the caregiver complains' and a majority (79, 87.8%) of paediatricians responded "yes" to the question 'do you do eye examination in children?', fifty four (59.3%) indicated that in practice they only examined a child's eye when the caregiver reports that the child has an eye problem, and only 24 (26.4%) indicated it was a routine part of every child's examination in their practice. In addition, all paediatricians disagreed with the statement that 'eye examination in children can only be done by an eye care worker'. These assertions were clarified during the in-depth interviews and focused group discussions where paediatricians conceded that only general inspection of the eyes is done when examining the eyes of children.

***Conclusion:*** Paediatricians had satisfactory knowledge and good attitude towards childhood eye diseases. However, their practices regarding childhood eye disease management were poor.

**Key words:** *Attitude, Childhood Eye Disease, Knowledge, Practice, Pediatricians*

## Introduction

Globally, childhood eye diseases constitute a momentous foundation for future visual morbidities. Potentially, a large portion can be prevented and/or cured when detected early. This is critical as visual indispositions have an impact in all domains of a child's development.[1–3] A paediatrician's day-to-day work encompasses treating children with all kinds of maladies including those that affect the visual system.[2] Early management of visual morbidities among children is imperative to circumvent irremediable conditions such as amblyopia.[2,4] To this end, timely diagnosis and management is critical and thus, obliges all medical professionals taking care of children to be abreast with the recommendations on screening for visual disorders among children set forth by the American Academies of Paediatrics and Ophthalmology and the American Associations for Pediatric Ophthalmology & Strabismus and of Certified Orthoptists.[2,3,5–7]

Timely recognition and management of childhood eye diseases by paediatricians is crucial to forestall visual loss which might be irreversible even with the best of treatment as in the case of amblyopia.[2,3] There is paucity of information on this despite the central role paediatricians play in this field. Studies in India[8] brought to the fore some shortcomings on the part of paediatricians with regards to routine visual system screening for visual disorders. paediatricians' understanding and assertiveness of visual disorders in children were by and large satisfactory, nevertheless, multi-disciplinary management of these challenges with ophthalmologists was deficient as reported in Jordan.[9]

A study done in Kenya reported that paediatricians' awareness of children with visual challenges was inadequate. Nonetheless, their practice and assertiveness were appropriate.[10] Ethiopian paediatricians' assertiveness were reported as constructive. However, their understanding was frequently low and their practice deficient.[11] Our research aimed to examine the Ghanaian paediatricians' role in early detection of childhood visual morbidities and to ascertain their knowledge, attitude and practices regarding management of childhood eye diseases which may delay discovery and referral of visual morbidities to the ophthalmologist.

Corresponding Author: **Dr. Gilbert Batieka Bonsaana**
Department of Ophthalmology, School of Medicine, University for Development Studies, Tamale, Ghana.
Email Address: gbonsaana@uds.edu.gh
Conflict of Interest: None Declared

## Materials and Methods

This study was a cross-sectional, mixed model design. We performed both quantitative and qualitative methods of investigation among paediatricians



doi: 10.60014/pmjg.v12i2.334

practicing in public and private hospitals and clinics in Ghana. Paediatrician in this study is a medical practitioner with at least, specialist training/ postgraduate qualification in paediatrics to the level of Membership and above from the Ghana College of Physicians and Surgeons or its equivalent and is registered with the Ghana Medical and Dental Council as a Member/Specialist and above.

The email addresses and telephone numbers of paediatricians working in Ghana were retrieved and contacted. The study team visited the facilities where the paediatricians contacted were practicing to collect data from 6th December 2018 to 30th July 2020 across the country. Data was also collected at the Paediatric Society of Ghana (PSG) Annual General Scientific Meeting (AGSM) in Kumasi 2019, Komfo Anokye Teaching Hospital, Directorate of Child Health (KATH, DCH) Paediatric Conference 2019 and at the Korle Bu Teaching Hospital, Directorate of Child Health (KBTH DCH) Morning meetings. All practicing paediatricians that consented were included. However, paediatricians who were no longer in active practice were excluded. Data collection was done in three phases: a self-administered questionnaire, an in-depth interview (IDI) and focused group discussion (FGD). The first section of the questionnaires probed the demographic characteristics of paediatricians. Secondly, level of knowledge on some common eye diseases including their symptoms, signs and management was explored. The third part of the questionnaire investigated paediatricians' attitudes towards eye diseases. Finally, the questionnaires ended with interrogations into paediatricians' practice with regards to childhood eye morbidities.

IDI and FGD were done following the administration, completion and collection of responses to all questionnaires. Participants for the IDI were selected by consecutive sampling. The interviews were one-on-one between an investigator and a participant and questions bordered on eight structured open-ended questions based on knowledge, attitude and practice of the participant with regards to common eye diseases. IDIs were halted at the 24th consecutive participant as there was no new information forthcoming, a stage of data saturation or a saturation point after the first 16 consecutive IDI. This was based on a study conducted by Hennink et al on 'code saturation versus meaning saturation: how many interviews are enough'[12]. The FGD involved groups of six participants in three sessions conducted at the KATH Paediatrics Conference in 2019. We selected the participants by convenience sampling based on their availability and willingness to participate. The discussion was based on the same questions used for the IDIs. The investigators participated in the focus group discussions as the moderators. The IDIs and FGDs were done to further explore the practitioners' knowledge, attitudes and practices with respect to ocular morbidities in children they attend to. Questions in the questionnaires left unanswered were addressed at this stage. The discussions were captured on a tape recorder.

## Ethical Approval

Ethical authorization for this research was acquired from the Ghana Health Service Ethical Review Committee (GHS-ERC 006/05/2018) and the Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-IRB/000102/2019). The study followed the Declaration of Helsinki (DoH) set of ethical principles.

### *Data analysis*

Microsoft excel data base was used to compile and clean up the data. The evolving sets of information was used to code responses received for open-ended questions. A mark of one was assigned to accurate answers and zero to wrong answers to questions on knowledge of common eye diseases. Aggregated marks were converted into percentages and catalogued into level of knowledge: 80 – 100%; 60- 79% and <60%, as "Good"; "Moderate" and "Poor", respectively as per the Original Bloom's cut off points.[10,13] "Satisfactory knowledge" was a sum of good and moderate. STATA version 14 was used to analyze the data. A p-value of less than 0.05 was statistically significant at 95% confidence level. Conceptualization, coding, and categorization of qualitative data were done during and following administration of questionnaires. The IDIs, FGDs and other qualitative data obtained were reviewed and explored to create initial codes. The codes were reviewed and revised or combined into themes, which were presented in a cohesive manner. Patterns and relationships were identified and linked to the research aims and objectives.

## Results

Ninety (90) paediatricians participated in this study. The median age was 36.5 (IQR= 34 – 41) years. The M:F = 1:2.9. The median duration of practice was 36 (IQR= 12 – 84) months. The probabilities of eye examination in children presenting to paediatricians practicing in Ghana was not related to age, gender, nature of practice and/or duration of practice as shown in Table 1, which demonstrates the background characteristics of paediatricians practicing in Ghana. The sum of knowledge on paediatric eye condition by the Bloom's cut-off points among participants was as follows: Fifty-three (60.2%) scored 80 – 100 % representing Good Knowledge; 33 (37.5%) scored 60 – 79% representing Moderate Knowledge and two (2.3%) scored below 60% representing Poor Knowledge. The average Bloom's score in this study was 79.0% (SD=9.1%). Almost all (86, 97.7%) paediatiricans practicing in Ghana had satisfactory knowledge of paediatric eye diseases, which is defined as the sum of good and moderate knowledge. The knowledge of paediatricians on selected paediatric eye conditions was generally impressive. All participants answered yes to the question 'is retinoblastoma treatable?'

  doi: 10.60014/pmjg.v12i2.334

**Table 1: Background characteristics of paediatricians practicing in Ghana.**

| Characteristics | | Performs Eye Examination in Children | | |
|---|---|---|---|---|
| | | No | Yes | |
| | N | n (%) | n (%) | $\chi^2$ (p-value) |
| **All Participants** | 90 | 11 (12.2) | 79 (87.8) | |
| **Gender** | | | | |
| Male | 23 | 1 (4.4) | 22 (94.7) | 1.786 (0.181) |
| Female | 67 | 10 (14.9) | 57 (85.1) | |
| **Age (in years)** | | | | |
| 30 – 35 | 41 | 7 (18.9) | 34 (82.9) | 1.71 (0.429) |
| 36 – 40 | 21 | 2 (9.5) | 19 (90.5) | |
| Above 40 | 28 | 2 (10.0) | 26 (92.9) | |
| **Nature of Practice** | | | | |
| CHAG* | 4 | 1 (25.0) | 3 (75.0) | 0.895 (0.639) |
| Private | 2 | 0 (0) | 2 (100.0) | |
| Public | 84 | 10 (12.9) | 74 (88.1) | |
| **Years of Paediatric Practice** | | | | |
| Less one year | 17 | 3 (17.7) | 14 (82.4) | 0.690 (0.875) |
| 1 – 5 years | 42 | 5 (11.9) | 37 (88.1) | |
| 5 – 10 years | 19 | 2 (10.5) | 17 (89.5) | |
| More than 10 years | 12 | 1 (10.0) | 11 (91.7) | |

**CHAG*** - Christian Health Association of Ghana (faith-based mission hospitals)

**Table 2: Multiple response analysis of response to knowledge of selected paediatric eye conditions**

| Eye condition (N=78) | Frequency | *Percent of Responses | #Percent of cases |
|---|---|---|---|
| **Causes of Leucocoria** | | | |
| No response/ don't know (n=0) | | | |
| Responded (n=90) | N=212 | | |
| Retinoblastoma | 84 | 39.6 | 93.6 |
| Cataract | 79 | 37.3 | 87.8 |
| ROP | 24 | 11.3 | 26.7 |
| Toxocariasis | 2 | 0.9 | 2.2 |
| Coat Disease | 2 | 0.9 | 2.2 |
| Others | 21 | 9.9 | 23.3 |
| **Signs of Retinoblastoma** | | | |
| No response/Don't know (n=4) | | | |
| Responded (n=86) | N=186 | | |
| White reflex | 78 | 41.9 | 90.7 |
| Proptosis/swelling | 46 | 24.7 | 53.5 |
| Poor Vision | 5 | 2.7 | 5.8 |
| Squint | 43 | 23.1 | 50.0 |
| Red eye | 14 | 7.5 | 16.3 |
| **Systemic illness in children associated with congenital cataract** | | | |
| No response/Don't know (n=9) | | | |
| Responded (n=81) | N=171 | | |
| Congenital Rubella syndrome | 66 | 38.6 | 81.5 |
| Toxoplasmosis | 28 | 16.4 | 34.6 |
| Cytomegalovirus | 24 | 14.0 | 29.6 |
| Galactosaemia | 17 | 9.4 | 21.0 |
| Diabetes | 7 | 4.1 | 8.6 |
| Other Metabolic Disorders | 5 | 2.9 | 6.2 |
| Down syndrome | 2 | 1.2 | 2.5 |
| Others | 22 | 12.9 | 27.2 |
| **Risk factors for Retinopathy of Prematurity** | | | |
| No response/Don't know (n=11) | | | |
| Responded (n=79) | N=153 | | |
| Prematurity | 70 | 45.8 | 88.6 |
| Prolonged high Oxygen exposure | 71 | 46.4 | 89.9 |
| Low birth weight | 11 | 7.2 | 13.9 |
| Others | 1 | 0.7 | 1.3 |
| **Signs and Symptoms of Congenital Glaucoma** | | | |
| No response/Don't know (n=32) | | | |
| Responded (n=58) | N=103 | | |
| Big Eye | 31 | 30.1 | 53.5 |
| Poor vision | 6 | 5.8 | 10.3 |



doi: 10.60014/pmjg.v12i2.334

| | | | |
|---|---|---|---|
| Cloudy Cornea | 19 | 18.5 | 32.8 |
| Excess tearing | 19 | 18.5 | 32.8 |
| Photophobia | 7 | 6.8 | 12.1 |
| Red eye | 15 | 14.6 | 25.9 |
| Blepharospasm | 1 | 1.0 | 1.7 |
| Others | 5 | 4.9 | 8.6 |
| **Causes of Painful Red eye** | | | |
| No response/Don't know (n=7) | | | |
| Responded (n=83) | N=174 | | |
| Trauma | 44 | 25.3 | 53.0 |
| Conjunctivitis (unspecified) | 47 | 27.0 | 56.6 |
| Allergy | 9 | 5.2 | 10.8 |
| Infection (unspecified) | 26 | 14.9 | 31.3 |
| Chemical | 2 | 1.2 | 2.4 |
| Glaucoma | 9 | 5.2 | 10.8 |
| Foreign body | 9 | 5.2 | 10.8 |
| Keratitis | 5 | 2.9 | 6.0 |
| Uveitis | 10 | 5.8 | 12.1 |
| Corneal ulcers | 4 | 2.3 | 4.8 |
| Retinoblastoma | 9 | 5.2 | 10.8 |

***Percent of Responses:** express these counts relative to the total number of times that each question was answered.
[#]**Percent of cases:** reports the percent of respondents who answered yes to each option in the question.

**Table 3: Practice of paediatricians with regards to childhood eye disease management**

| Practice | N (%) |
|---|---|
| **Do you do eye examination in children?** | |
| No | 11 (12.2) |
| Yes | 79 (87.8) |
| **If Yes, how often/ when do you do eye examination?** | **(n=78 responded, multiple responses analysed 91)** |
| When caregiver reports child has eye problem | 54 (59.3) |
| At every MCH/FP visit | 2 (2.2) |
| As a routine part of every child's examination | 24 (26.4) |
| Others | 11 (12.1) |
| **Which tests do you do** | **(n=61 responded; multiple responses analysed 83)** |
| Pupillary Light reflex | 42(50.6] |
| Visual Acuity | 15(18.1) |
| Funduscopy | 9 (10.8) |
| Eye movement Examination | 15 (18.1) |
| Other Physical examination of Eye | 2 (2.4) |
| **Reasons for not doing eye examinations** | **(n=14 responded; multiple responses analysed 20)** |
| Don't have enough time | 1 (5.0) |
| No equipment | 11 (55.0) |
| Don't know how to | 4 (20.0) |
| children uncooperative | 4 (20.0) |
| **How do you manage children with painful red eye?** | **(n=90 responded; multiple responses analysed 98)** |
| Refer immediately to eye care worker | 33 (33.7) |
| Give eye drops | 5 (5.1) |
| Give eye drops and refer immediately to eye care worker | 10 (10.2) |
| Give eye drops and refer if no improvement | 45 (45.9) |
| Other | 5 (5.1) |
| **How do you manage a child with white pupillary reflex?** | |
| Refer to eye care worker immediately | 85 (95.5) |
| Follow up and refer if it doesn't resolve | 1 (1.1) |
| Other | 3 (3.4) |
| **How do you manage children with squints?** | |
| Refer to eye care worker immediately | 84 (93.3) |
| Follow up and refer if it doesn't resolve | 5 (5.6) |
| Other | 1 (1.1) |
| **What do you do with children who you suspect might be at risk of ROP?** | |
| Refer to eye care worker immediately | 75 (93.8) |
| Correct Oxygen therapy | 4 (5.0) |
| Funduscoy | 1 (1.3) |
| **How do you manage children with ophthalmia neonatorum?** | **(n=88 responded; multiple responses analysed 119)** |
| Refer to eye care worker immediately | 6 (5.0) |
| Thorough irrigation of the eye | 39 (32.8) |
| Give eye drops | 32 (26.9) |
| Give eye drops and refer immediately to eye care worker | 25 (21.0) |
| Give eye drops and refer if no improvement | 17 (14.3) |



doi: 10.60014/pmjg.v12i2.334

| | |
|---|---|
| **How do you manage children you suspect have glaucoma?** | |
| Refer to eye care worker immediately | 88 (100) |

**Table 4: Logistic Regression evaluating the sociodemographic characteristics of paediatricians versus understanding of visual morbidities in children.**

| Characteristics | Odds Ratio | 95% Confidence interval |
|---|---|---|
| **Gender** | | |
| Male | 1.3 | 0.5 – 3.5 |
| Female | ref | |
| **Age (in years)** | | |
| 30 - 35 | 1.3 | 0.5 – 3.5 |
| 36 - 40 | 0.6 | 0.2 – 1.8 |
| Above 40 | ref | |
| **Nature of Practice** | | |
| All others | ref | |
| Public | 8.6 | 1.0 – 77.7 |
| **Years of Paediatric Practice** | | |
| Less one year | 1.4 | 0.3 – 6.3 |
| 1 – 5 years | 1.9 | 0.5 – 6.8 |
| 5 – 10 years | 1.4 | 0.3 – 5.9 |
| More than 10 years | ref | |
| **Performs Eye Examinations** | | |
| Yes | ref | |
| No | 1.2 | 0.3 – 4.4 |

On the question 'when should a child with congenital cataract be referred to an eye care worker?' virtually all (89, 98.9%) participants indicated immediately. Sixty-eight (77.3%) participants indicated that retinopathy of prematurity is treatable. However, 10 (11.4%) indicated that it was not treatable whilst another 10 (11.4%) indicated they did not know if it was treatable or not. Whilst 77 (85.6%) participants knew that congenital glaucoma was treatable, 13 (14.4%) did not know.

Though all paediatricians knew children could get refractive errors, only 27 (30%) indicated that it could be detected by refraction. Eighty-seven (96.7%) participants did not know that squints are treatable, only three (3.3%) knew they are treatable. Eighty-eight (97.8%) participants knew that ophthalmia neonatorum is preventable whilst two (2.2%) did not know. **Table 2** shows the multiple response analysis of responses to knowledge of selected paediatric eye conditions among paediatricians practicing in Ghana.

The attitude of paediatricians to childhood visual morbidities was generally exceptional as detailed below. Virtually all (89, 98.9%) participants disagreed with the statement that 'eye examination in children should be done only when the caregiver complains'. Only one (1.1%) did not now. All participants disagreed with the statement that 'eye examination in children can only be done by an eye care worker'. However, they all agreed that 'children with white pupillary reflex should be reviewed by an eye care worker'. Though 68 (79.1%) participants agreed with the statement that 'you can adequately inform caregivers on the consequences of squints in children', 10 (11.6%) disagreed and eight (9.3%) did not know. Eighty-two (91.1%) participants agreed that 'children can use spectacles effectively' however, three (3.3%) disagreed and five (5.6%) did not know. Whilst 56 (62.2%) participants agreed with the statement that 'congenital glaucoma is an important issue in your paediatric practice', 22 (24.4%) disagreed and 12 (13.3%) did not know. Sixty-three (70.0%) participants agreed with the statement that 'your training adequately equips you to diagnose, manage and refer children with eye diseases' whist 25 (27.8%) disagreed and two (2.2%) did not know. All participants agreed that 'children with cataracts require a thorough systemic review by the paediatrician' and that 'eye examination by a paediatrician could help in early detection of retinoblastoma'. Thirty-five (39.7%) participants agreed with the statement that 'retinopathy of prematurity is a big problem in your practice', however, 28 (31.8%) disagreed and 25 (28.4%) did not know. Whilst 87 (96.7%) participants agreed with the statement that 'good antenatal and immediate postnatal care can help reduce the burden of ophthalmia neonatorum', three (3.3%) did not know. Table 3 demonstrates the practice of paediatricians with regards to eye disease management in Ghana. There was no statically significant association between good knowledge on childhood eye disease, sociodemographic characteristics (age, gender, and nature of practice and duration of practice) and the chances of eye examination in children presenting to paediatricians practicing in Ghana as demonstrated in Table 4.

***IDIs and FGDs with regards to knowledge of childhood eye diseases.***

In response to the question, 'It has been shown that many paediatricians do not recognize children with poor vision. Why do you think so?' Paediatricians' responses were as follows; 'poor history taking techniques, lack of routine eye tests and limited ophthalmology rotation during medical school and paediatric residency training may be a reason'. Paeditricans also mentioned that lack of routine eye examination could be a culprit, thus, 'If patient or caregiver do not complain you do not bother examining the eyes', and that 'you do not go looking for

  doi: 10.60014/pmjg.v12i2.334

something if you do not know about it'. All paediatricians responded, 'yes' to the interrogation 'in your facility, do you know where you can refer children with poor vision?' Paediatricians reiterated that 'Almost all patients with eye complaints are referred to the eye clinic.'

***IDIs and FGDs with regards to attitude of paediatricians towards childhood eye diseases.***

In response to the question, 'What are some of your beliefs towards eye diseases in children?' Paediatricians practicing in Ghana thought that 'attention is not given to eye care in Ghana', and that there is 'no focus on eye care in Ghana'. They also indicated that 'medical school training and paediatric residency training in ophthalmology were very inadequate'. Paediatricians attested to the fact that 'Early detection and diagnosis of eye disease is crucial and that prognosis is good if detected early, but eye diseases are not being picked up as they should,' and that 'Newborn eye examination should be a routine, all doctors, especially paediatricians should be able to examine the eyes properly and this should be a priority in medical school and paediatric residency training.'

***IDIs and FGDs on practices of Paediatricians regarding childhood eye disease management.***

All Paediatricians responded 'yes' to the questions; 'Have you ever had a child with eye disease? 'and 'Have you ever examined the eyes of children?' They however, conceded that 'only inspection is done when examining the eyes of children' and that 'Though pallor and jaundice of the conjunctiva is examined routinely', 'detailed eye examination is not done'. 'Not even pupillary reactions are checked for routinely,' 'No red reflex and/or ophthalmoscopy is routinely done during the examination of the eyes of children.' In response to the question, 'Why don't you examine the eyes of children?' Paediatricians responded that they 'lack expertise,' and have 'no time and equipment to examine the eyes of children', and 'would rather refer to an eye health care provider'. When asked; 'What are some of the reasons that make examining the eyes of children unpopular among paediatricians?' Paediatricians indicated that children's eye examination is 'Generally not a routine' and that 'Children do not cooperate for their eyes to be examined as some children refuse to open their eyes'. The situation is aggravated by the fact that most of them indicated that 'they do not have the expertise, time and equipment needed for proper eye examination of children at the clinics and wards. The IDIs and FGDs revealed the following, which filled in the cracks in some questions avoided by paediatricians in the self –administered questionnaires. In response to the question, 'what are some of the reasons that make examining the eyes of children unpopular among paediatricians?' paeditricians responded: 'lack expertise' 'no equipment', 'no time,' and 'children do not cooperate for their eyes to be examined as some children refuse to open their eyes'. Other responses were: 'you have to go an extra mile to even check vision as it was generally not a routine'; 'Visual acuity is not checked in routine paediatric examination, not to talk of checking for red reflex or doing ophthalmoscopy/ fundoscopy.' They further disclosed the following: 'Generally, there is lack of focus on eye examination during residency training in paediatrics.'; 'the use of ophthalmoscope to check for red reflex is done sparingly usually in the newborn due to lack of expertise, equipment and/or time' in their practice; 'If patient or caregiver do not complain you do not bother examining the eyes.'

## Discussion

A child under nine years has an immature visual system and is predisposed to developing amblyopia. The visual pathway must be uninterrupted to allow it advance to its full potential and thus visual morbidities in youngsters must be managed properly.[4,14] A paediatrician's daily routine includes managing various illnesses among children including eye conditions and involves the use of validated techniques and effective mechanisms to detect potentially treatable visual system disorders and may subsequently refer to an ophthalmologist for timely diagnosis and treatment to avert a lifetime of ophthalmic morbidity with its attendant unacceptable disability-adjusted life years (DALYs).[2,15–17] In this circumstance, one DALY means one lost year of healthy life owing to visual impairment and/or blindness[16,17]. This study, therefore, set out to evaluate the knowledge, attitudes and practices of Ghanaian paediatricians with regards to the management of visual morbidities among children.

According to the Original Bloom's cut-off point, more than half (53, 60.2%) of paediatricians practicing in Ghana had good knowledge of childhood eye diseases and it is worth noting that almost all (86, 97.7%) had satisfactory knowledge. The average Bloom's cut-off score on knowledge was 79.0% (SD=9.1%), which is categorized as 'moderate knowledge'. In contrast to a similar study done by Wanyama et al. among Kenyan paediatricians, 69.60% exhibited poor knowledge.[10] In addition, studies done in Kenya and Brazil had their averages in the category of 'poor knowledge' with average scores of 54.82% (SD 10.7%) and 58%, respectively.[10,18] It is possible that more emphasis is placed on many more ophthalmic conditions during the training of paediatricians in Ghana, which might be due to improvement of curriculum as compared to the older Brazilian and Kenyan studies. However, an overwhelming 87 (96.7%) paediatricians practicing in Ghana did not know if squint/ strabismus is treatable while 32 (35.56%) either did not know the answer to or did not provide a response to a question on the signs and symptoms of congenital glaucoma. It is worth noting that, early detection of these two conditions in the paediatric patient is critical in order to avert loss of vision and so it is imperative that paediatricians' knowledge on them is adequate.

  doi: 10.60014/pmjg.v12i2.334

The majority (84, 93.6%) of paediatricains in our study cited retinoblastoma as a likely cause of leucocoria. This is consistent with the 90.6% reported by Wanyama et al in Kenya[10] and 83.3% reported by Ababneh et al in Ethiopia.[9] In disparity with a similar study done by Michel et al. in Brazil, only 37% declared retinoblastoma as a likely cause of leucocoria.[18] The credit could be attributed to the general awareness creation activities to promote childhood cancers over-all amidst heightened mass media drive on retinoblastoma in Ghana at a time the country seeks to develop a National Retinoblastoma Data Base. This supposes that more paediatricians will potentially refer affected children for ophthalmic attention. The proportion of respondents who mentioned retinopathy of prematurity (ROP) as a cause of leucocoria was 24 (26.7%). This is relatively higher than the Kenyan study (17.95%), however, it is lower than that of the Brazilian study (37%).[10,18] The Brazilian study was carried out in an urban health system with advanced equipment to cater for premature neonates and perhaps paediatricians as a whole were more likely to encounter children with ROP. Our research which was analogous to that of the Kenyan study was carried out among practicing paediatricians along the length and breadth of the country most of whom were found in settings where there were no advanced and /or modern equipment to support premature infants and accordingly limiting the acquaintance of participants to ROP[10].

Consequentially, with regards to ROP's risk factors, only 11 (13.9%) and 22.8% paediatricians cited low birth weight in Ghana and Kenya, respectively. However, 68 (77.3%) Ghanaian paediatricians said ROP was treatable as compared with 62.8% of Kenyan paediatricians[10] which was commendable. The cardinal trio indicator of congenital glaucoma, namely, photophobia, excessive tears and blepharospasm were mentioned by only 26.3% of paediatricians who responded to this question in our study. This is consistent with that reported by Wanyama et al in which less than a fifth of the respondents mentioned the triad of symptoms.[10] These responses are much lower than those reported by Michel et al. in which more than 48% of respondents stated the trio of symptoms.[18] Nevertheless, acquaintance with the cardinal trio indicator of congenital glaucoma in all the studies was inadequate. One might ascribed these findings to the comparative scarcity of congenital glaucoma, which affects 1 in 10,000 children globally.[19]All paediatricians in this study knew that children could get refractive errors, however, only 27 (30%) indicated that it can be detected by refraction.

This concurs with the Kenyan study which reported that virtually all participants (98.4%) discerned that refractive errors can occur in children. However, merely 19.2% stated how to detect it correctly.[10] In both studies, paediatricians could not correctly state that refractive error can be detected by refraction and this is worrying considering the fact that ametropia is the foremost and needless cause of visual impairment among children worldwide and yet the most easily and cost effectively correctable.[20] Paediatricians demonstrated outstanding awareness about squints as all respondents stated that squints/ strabismus are correctable. Our findings agrees with studies in Kenya and Brazil in which 93.6% and 85% knew that squints are treatable.[10,18] Paediatricians' attitude in this study was generally positive as almost all (89, 98.9%) paediatricians disagreed with the suggested statement that eye examination in children should be done only when the caregiver complains. All the respondents disagreed with the statement that 'eye examination in children can only be done by an eye care worker.' In addition, all respondents agreed that eye examination by paediatricians could aid with timely recognition of retinoblastoma. These findings concurs with Wanwama et al. in which almost all paediatricians (98.4%) interviewed disagreed with these two statements while 99.2% agreed that eye examination by paediatricians could aid with prompt recognition of retinoblastoma.[10] Sixty three (70.0%) of the respondents established that their training was sufficient to identify and refer children with visual indispositions while 68 (79.1%) indicated they could advise caregivers on the imports of squints/ strabismus. Our figures are higher than those reported by Wanyama et al which were 60.8% and 70.4%, respectively[10]. In both studies, there is the need for an avenue to be fashioned out to plug these gaps identified. These indicate an acknowledgement by the respondents of their indispensable role in the management of childhood visual disorders and consequently offers a golden opportunity to seal the cracks found in this study.

Evaluation of paediaricians' practices was encouraging as majority (79, 87.8%) of paediatricians responded suggested they do examine the eyes of children. Nonetheless, in a multiple response with a follow up question 54 (59.3%) said they would examine a child only when the caregiver reported the child had an eye problem, and only 24 (26.4%) would routinely examine the eyes as part of every child's examination. In a similar study in Kenya, 87(69.6%) disclosed performing eye examination in youngsters whilst 43.5% carried it out as a routine and an equivalent proportion examines the eye when the guardian gives information that child has a visual difficulty.[10] These responses in both studies are unsatisfactory. This is because a significant number of visual challenges in children turn to be asymptomatic in the early stages without any discomposure that might draw the custodians and/or paediatricians' attention and stands the chance of being missed in the mist of lack of standard visual examination protocols. In the course of IDIs and FGDs, paediatricians conceded that only inspection is done when examining eyes of children and that though pallor and jaundice of the conjunctiva is examined routinely, detailed eye examination was not done. This was confirmed in a multiple response to the question where 42 (50.6%) participants said they performed pupillary

  doi: 10.60014/pmjg.v12i2.334

light reflex and 15 (18.1%) only visual acuity routinely. Only nine (10.8%) mentioned fundoscopy and none mentioned corneal light reflex, cover test or red reflex test. This is similar to the Kenyan study where tests mentioned included visual acuity (42.5%), fundoscopy (33.3%) and pupillary light reflexes (23.0%).[10] Similar surveys carried out in the United States of America (USA) reported higher proportions ofpaediatricians who examines the eye routinely than in our study as 83% and 75% of participants in that study performed the fundal reflex and the cover test, respectively and approximately 97% of paediatricians indicated that they included a minimum of one element of ocular tests during any routine preschool medical screening among children.[5] These commendable findings might be attributable to the mandatory guiding principles issued by the American Academy of Paediatrics that enjoins all paediatricians to follow during their routine practice in the USA.[2,3,7] In this study, 76 (84.4%) paediatricians did not give reasons for not doing eye examination in children in the self-administered questionnaires. There were only 20 multiple responses to this question. 'No equipment' was mentioned by 11 (55.0%), 'do not know how to' by four (20.0%), 'children uncooperative' by three (15.0%) and 'do not have enough time' by two (10.0%) paediatricians. These responses are analogous to those found by Wanyama et al where 87 (69.6%) avoided the question. The utmost collective explanation for failure to perform visual assessment in children were insufficient time as mentioned by 39.5% whilst 31.6% disclosed that they did not know how to perform eye examination in children.[10] Similar studies in the US, reported hurdles to visual assessment as too time consuming and that children are difficult to examine,[5] a drift that agrees with comparable reports by Terry et al and our findings.[6]

***Weakness and strengths of the study***

This study did not include an observational component and thus some responses especially on the practice's aspect could not be verified and confirmed. The strength of the study lies in the fact that we conducted IDIs and FGDs, which clarified and interrogated the participants on some of their responses. This was lacking in previous studies.

## Conclusion

According to the original Bloom's cut-off point more than half of paeditricians practicing in Ghana had good knowledge of childhood eye diseases and it is worth noting that almost all paediatricians had satisfactory knowledge. Paediatricians practicing in Ghana were found to have good attitude towards childhood eye diseases but their practices were hampered by inadequate clinical skills and lack of ophthalmic equipment.

## Recommendation

Residents in paediatrics should rotate through paediatric ophthalmology. Eye examination should be enshrined into the routine general paediatric examination of all children. Basic ophthalmic equipment such as ophthalmoscopes should be made readily available at all paediatric clinics. Further studies should include observational studies to explore reasons for not examining children's eyes routinely.

## References


1. Tadic V, Pring L, Dale N. Attentional processes in young children with congenital visual impairment. *Br J Dev psychol*. 2009; 27:311-330.
2. Donahue SMP, Arnold RM, Bradford GEM, Epley DM, Peterseim MM. A practical guide for primary care physicians: instrument-based vision screening in children. *Am Acad Pediatr*. 2016:1-7.
3. Modest JR, Majzoub KM, Moore B, Bhambhani V, McLaughlin SR, Vernacchio L. Implementation of Instrument-Based Vision Screening for preschool-age children in primary care. *Pediatr*. 2017;140:e201 63745. doi:https://doi.org/1 0.1 542/peds.201 6-3745
4. Clare G, Jungo R. Magnitude and causes of visual impairment and blindness in children. In: The Epidemiology of Eye Disease. 3rd Ed. Imperial College Press; 2012.
5. Jungo S, Richard L. A survey of paediatricians' practice and training in routine infant eye examination. *Arch Dis Child*. 1988;78:364-366.
6. Terry C, Wendy M, Hughes E. Compliance with Vision-Screening Guidelines among a national sample of pediatricians. *Ambul pediatr*. 2002;2:449-455.
7. Ruben JB, Granet DB, Blocker RJ, et al. Instrument-based pediatric vision screening policy statement. *Pediatr*. 2012; 130. doi:10.1542/peds.2012-2548
8. Sathjamohanraj S, Parag K, Senthilkumar. Awareness of retinopathy of prematurity among pediatricians in a tier two city of South India. *Oman J Ophthalmol*. 2011;4:77-80.
9. Ababneh LT, Khriesat W, Dalu SA, et al. Knowledge of and attitude to eye disorders among pediatricians in North Jordan. *Ann Med Surg*. 2021;67:102430. doi:10.1016/j.amsu.2021.102430
10. Wanyama SP, Marco S, Kariuki MM. Knowledge , attitude and practice of eye diseases in children among paediatricians in Kenya. *J Ophthalmol East Cent S Afr*. 2015;19:22-26.
11. Regassa TT, Daba KT, Fabian ID, Mengasha AA. Knowledge, attitude and practice of Ethiopian pediatricians concerning childhood eye diseases. *BMC Ophthalmol*. 2021;21:91. doi:10.1186/s12886-021-01842-5


  doi: 10.60014/pmjg.v12i2.334

12. Hennink MM, Kaiser BN, Marconi VC. Code saturation versus meaning saturation: How many interviews are enough? *Qual Health Res*. 2017;27:591-608. doi:10.1177/1049732316665344
13. Khandekar R, Harby SA, Harthy HA. Knowledge, attitude and practice regarding eye complications and care among Omani persons with diabetes. *omajol*. 2010;3:60-65.
14. Arnold RW. Towards worldwide amblyopia elimination-vision screening. *Eur Ophthalmic Rev*. 2009;2:91-98.
15. Donahue SP, Baker CN. Visual system assessment in infants, children, and young adults by pediatricians. *Pediatr*. 2016;137. doi:10.1542/peds.2015-3596
16. Li HY, Liu YM, Dong L, et al. Global, regional, and national prevalence, disability adjusted life years, and time trends for refraction disorders, 1990–2019: Findings from the global burden of disease study, 2019. *BMC Public Health*. 2021;21:1-12. doi:10.1186/s12889-021-11648-1
17. He M, Wang W, Huang W. Variations and trends in health burden of visual impairment due to cataract: A global analysis. *Investig Ophthalmol Vis Sci*. 2017;58:4299-4306. doi:10.1167/iovs.17-21459
18. Michel B, Zelia MS, Italo M. What do pediatricians know about children's eye diseases? *Arch Bras Ophthalmol*. 2003;66:489-492.
19. Bowling B. Kanski's Clinical ophthalmology - A systematic approach. 2016.
20. Holden BA. Uncorrected refractive error: The major and most easily avoidable cause of vision loss. *Community Eye Heal J*. 2007;20:37-39.

  doi: 10.60014/pmjg.v12i2.334