

Knowledge, attitude and practice in assessment of childhood ocular disorders among primary health workers in Garissa district, Kenya

Mbogo SO, Kahaki K, Njambi L

Department of Ophthalmology, College of Health Sciences, University of Nairobi, P.O. Box 19676, Nairobi, Kenya

Corresponding author: Dr. S.O. Mbogo. Email: samwelmbogo@yahoo.com

ABSTRACT

Objective: To determine the knowledge, attitude and practice in assessment of childhood ocular disorders among primary health workers in Garissa district, Kenya.

Methods: A cross-sectional study was conducted between December 2013 and January 2014 in health centers and dispensaries within Garissa district. Quantitative data was collected using semi-structured questionnaires among 45 primary health workers. The process was through direct interview where the participants were asked questions and shown pictures of common childhood ocular disorders.

Results: The level of knowledge and practice varied depending on the area of assessment amongst the 45 participants. The correct diagnosis among participants were 51.11% for ophthalmia neonatorum, 13.33% for congenital glaucoma, 80%, 13.33% and 4.44% for ophthalmia neonatorum, congenital glaucoma, strabismus, corneal ulcer and refractive error respectively. Most (80%) of the respondents attributed wearing of spectacles to poor vision without giving actual diagnosis of refractive errors. Red eyes were mainly attributed to trauma (44.44%) and infection (44.44%). White eye reflex was mainly attributed to cataract by 64.44% of the participants while only 6.67% mentioned retinoblastoma. Only 20% had some knowledge on physical ocular signs of vitamin A deficiency. Over 50% of the participants would refer the cases assessed apart from ophthalmia neonatorum, red eyes and vitamin A deficiency which most of the participants would start the patients on treatment first. Most respondents believe the eye conditions could lead to vision loss except for strabismus.

Conclusion: There was generally poor knowledge in both assessment and management of childhood ocular disorders. Structured approach should be enhanced through regular training and use of childhood eye disease manual.

INTRODUCTION

Early and accurate detection of childhood ocular disorders may be a challenge to primary health workers. They range from congenital/hereditary to acquired eye conditions including trauma. Some eye disorders in children must be diagnosed early to prevent loss of vision, mortality and to optimize treatment outcomes. Certain eye conditions which are easily missed include amblyopia, glaucoma, ocular inflammation, strabismus, trauma, nystagmus and leukocoria amongst others¹.

Approximately three-quarters of the world's blind children live in the poorest regions of Africa and Asia. Almost half of all blindness in children especially from the poorest communities are due to avoidable causes that are amenable to cost effective interventions^{2,3}.

Primary health workers especially those working in dispensaries and health centers play a crucial role in integrated eye care services. They have very close contact with the community, especially at village level. It is imperative for them to have basic understanding of eye disorders for prompt management or referral. In almost all these situations the primary point of contact is often not an eye care professional but other health professionals. Often, eye care services suffer where countries do not have the infrastructure to produce or attract eye care workers in the required numbers⁴.

A study done in Meru South and Kisumu East districts of Kenya at MCH clinics in primary health facilities showed that 55.4% of the health workers correctly diagnosed the red eye, 95.2% ophthalmia neonatorum and 80.7% squint. However, the practice towards eye diseases in general was low. The child health and nutrition card section of Mother and Child Health (MCH) booklet was well completed in 78.1% but the section on identification of early eye problems was only completed in only 0.8% of the children⁵.

In a study conducted in Mwanga district, Tanzania; among the 49 respondents, skills in assessing visual acuity and recognizing specific eye diseases and their management were weak⁶. Cataract (white pupil) was correctly identified by 67.3% of respondents and 63.2% mentioned surgery as the treatment; 67.3% correctly recognized and stated the proper management of conjunctivitis (antibiotics). Severe eye injury was recognized by 75.5% of health workers and 69.3% knew how to manage it correctly (immediate referral). The mean skills score of all respondents was 6.2 out of a possible 12⁶.

A baseline study of eye service provision at health centers in 2 districts in Malawi carried out in late 2010 indicates that medical assistants, enrolled nurses and patient attendants report that they provided treatment to eye patients. However, the research showed that these workers generally had poor skills. Only 56% could

accurately identify a cataract. The level of knowledge and skills of health workers in this setting appears to be too limited to ensure that children receive appropriate and timely interventions. Delay in referral and intervention is a critical problem in Africa and contributes to childhood blindness⁷.

A pilot study in Kilimanjaro Region of Tanzania found that there was also very minimal knowledge on the aetiology of various eye diseases and considered everything as being infections. Overall, 88% of workers recognized cataract in a picture, 63% knew that it required surgery but only 50% realized surgery was urgent. Only 38% recognized squint as needing referral and none considered this urgent. Moreover, 38% could correctly suggest a cause of a large corneal scar⁸.

A study done in Ethiopia by Yewubnesh *et al*⁹ showed that, the concept of Primary Eye Care (PEC) as an integral part of Primary Health Care (PHC) is not well incorporated in the training and job descriptions of health workers in developing countries.

MATERIALS AND METHODS

This was a cross sectional study involving all nurses and clinical officers working in health centers and dispensaries within Garissa district. Those working in higher health institutions were excluded. The number of the health workers in the targeted institutions was obtained from the regional office. The data was collected between December 2013 and January 2014.

All the potential participants were given brief introduction on the nature of the study, its purpose and assurance of confidentiality. Those who accepted to participate signed a consent form before taking part in the study. Those who were absent at their respective institutions were contacted through phone to find out if they were willing and going to be available for the study.

The participants were directly interviewed and the information recorded in semi-structured interviewer questionnaires capturing the specific objectives. Confidentiality of the participants was observed by not indicating their names on questionnaires or any form of identification. Selected pictures were shown to the participants during the interview depending on the questions being asked. The participants were required to identify the pictures and answer related questions. The interview was carried out by the principle investigator and a study assistant.

Data collected was coded, entered into Microsoft excel database and subsequently analysed using STATA software version 11.

The study proposal was approved by Kenyatta National Hospital/University of Nairobi Research and

Ethics Committee. An introductory letter was also obtained from division of ophthalmic services to facilitate collection of data.

RESULTS

The study had anticipated to recruit all the 51 Primary Health Workers (PHW). However, 4 were absent and 2 declined to participate. Forty five PHW responded, thus a response rate of 88.24%. The mean age of the respondents was 29.64 (SD 4.49), median 28, range of 23-48 years. The male: female ratio was 1:1.6. Most (66.67%) of responders were Kenya Registered Community Health Nurses (KRCHN). The mean duration of practice was 5.99 (SD 4.18), median 5 and range of 1-23 years. The respondents were almost equally distributed between the health facilities with a slight majority (51.11%) stationed at dispensaries (Table 1).

Table 1: General characteristics of the study participants

Variable (n=45)	Frequency	(%)
Age-groups (years)		
20 – 25	4	8.89
26 – 30	28	62.22
31 – 35	6	13.33
36 and above	7	15.56
Gender		
Female	28	62.22
Male	17	37.78
Designation		
Clinical Officer	8	17.78
BScN	0	0
KRCHN	30	66.67
KECHN	7	15.56
Duration of practice (years)		
1 – 5	24	53.33
6 – 10	18	40.00
11 – 15	2	4.44
16 and above	1	2.22
Station		
Dispensary	23	51.11
Health Centre	22	48.89
Post qualification PEC training	1	2.22

Ophthalmia neonatorum was correctly diagnosed by 51.11% of PHW with 66.67% able to identify the signs displayed. The main attributed risk factor was infected birth canal as given by 68.89% of the respondents. In management, majority (40%) would give eye drops or ointment for treatment. Tetracycline Eye Ointment (TEO) would be the most prescribed by 88.89% of PHW who chose to treat with eye medication (Tables 2 and 3).

Table 2: Knowledge of ophthalmia neonatorum

Variable (n=45)	Frequency	(%)
Signs identified in picture		
Purulent discharge	14	31.11
Purulent discharge / Swollen eyelids	30	66.67
Swollen eyelids	1	2.22
Diagnosis		
Ophthalmia neonatorum/	23	51.11
Neonatal conjunctivitis	13	28.89
Eye infection	1	2.22
Syphilis	1	2.22
Trachoma	1	2.22
Don't Know	7	15.56
Aetiology/ Risk factors*		
Infected birth canal	31	68.89
Unsterile hands of birth attendants	5	11.11
Don't know	5	11.11
Bacterial infection	5	11.11
Foreign body	2	4.44
Eye trauma	1	2.22

* Multiple responses allowed.

Table 3: Practice in management of ophthalmia neonatorum

Variable (n=45)	Frequency	(%)
Management*		
Clean eyes, topical (eye) & systemic antibiotics	4	8.89
Clean & give eye medication	17	37.78
Treat then refer	4	8.89
Vitamin A	1	2.22
Eye drops/ ointments only	18	40.00
Topical (eye) and systemic antibiotics	3	6.67
Systemic antibiotics	3	6.67
Prevention*		
Cleaning eyes after birth	19	42.22
Application of tetracycline eye ointment to newborns	22	48.89
Good management of labour	4	8.89
Prompt treatment of infections in antenatal mothers	22	48.89
Others	7	15.56
Choice of eye medication (n=43)		
Gentamycin	1	2.22
TEO	40	88.89
TEO + Gentamycin	1	2.22
TEO + Neomycin	1	2.22

Others include don't know (n=1), health education on eye hygiene (n=5) and use of glasses (n=1)

Glaucoma was diagnosed by only 13.33% of the PHW. However, 60% were able to correctly identify the hazy cornea. Majority (71.11%) did not know if glaucoma is treatable. The practice was generally good as most (71.11%) of PHW would refer such a case. The few who mentioned eye medication were unable to specify the type (Table 4).

Strabismus was well diagnosed by 80% of the PHW and the sign correctly identified by 91.11% of them. Majority (64.44%) would refer for management (Table 5).

Table 4: Knowledge and practice in congenital glaucoma

Variable (n=45)	Frequency	(%)
Signs in the pictures*		
Hazy cornea	27	60.00
None	7	15.56
Lens opacity	2	4.44
Big eyes	10	22.22
Diagnosis		
Glaucoma	6	13.33
Cataract	5	11.11
Neonatal conjunctivitis	1	2.22
Vitamin A deficiency	1	2.22
Don't know	32	71.11
Is condition treatable?		
Don't know	32	71.11
Yes	13	28.89
Management		
Give eye drops/ointment	2	4.44
Give eye drops then refer if no improvement	2	4.44
Refer immediately	32	71.11
Advice on spectacles	1	2.22
Don't know	7	15.56
Vitamin A	1	2.22

* Multiple responses allowed

Table 5: Knowledge and practice in strabismus

Variable (n=45)	Frequency	(%)
Signs identified in the picture		
Abnormal eye deviation	41	91.11
Normal eyes	1	2.22
Don't know	3	6.67
Diagnosis		
Squint/strabismus	36	80.00
Don't know	8	17.78
Congenital eye problem	1	2.22
Is the condition treatable?		
Yes	17	37.78
No	13	28.89
Don't know	15	33.33
Management		
Reassure	6	13.33
Observe then refer if no improvement	1	2.22
Refer *	29	64.44
Advice on spectacles	2	4.44
Don't know	6	13.33
Vitamin A	1	2.22

*Refer includes refer immediately (n=21) and refer for surgery (n=8)

Leukocoria was mainly attributed to cataract by 64.44% of PHW. Only 8.89% to retinoblastoma or eye tumour. Most of the cases would be referred by 95.55% of the respondents. Surgery was mentioned by 44.44% of them as the reason for referral (Table 6).

Table 6: Knowledge and practice in leukocoria

Variable (n=45)	Frequency	(%)
Signs identified in the picture		
White eye reflex	21	46.67
Distorted pupil	2	4.44
Lens opacity	20	44.44
Swollen eyes	2	4.44
Diagnosis		
Cataract	29	64.44
Retinoblastoma	3	6.67
Eye infection	1	2.22
Don't know	8	17.78
Trachoma	1	2.22
Glaucoma	1	2.22
Vitamin A deficiency	1	2.22
Eye tumour	1	2.22
Is this condition treatable?		
Yes	34	75.56
No	5	11.11
Don't know	6	13.33
Management		
Refer immediately	23	51.11
Don't know	1	2.22
Refer for surgery	20	44.44
Vitamin A	1	22.22

Corneal ulcer was diagnosed by 13.33% of PHW correctly. In practice, 64.44% would refer without intervention. TEO was the most (83.33%) probable eye medication to be prescribed in treatment (Tables 7 and 8).

Table 7: Knowledge of corneal ulcer

Variable (n=45)	Frequency	(%)
Signs identified in the picture*		
Hazy cornea	23	51.11
Red eyes	27	60.00
Lens opacity	2	4.44
Abnormal pupil	4	8.89
Don't know	1	2.22
Swollen eyes	5	11.11
Corneal scar	1	2.22
Corneal ulceration	2	4.44
Eye lid ulcer	1	2.22
Diagnosis		
Corneal ulcer	6	13.33
Eye tumour	7	15.56
Trachoma	4	8.89
Eye trauma	1	2.22
Don't know	17	37.78
Entropion	1	2.22
Conjunctivitis	6	13.32
Cataract	2	4.44
Blindness	1	2.22
Is the condition treatable?		
Yes	19	42.22
No	8	17.78
Don't know	18	40.00

* Multiple responses allowed

Table 8: Practice in management of corneal ulcer

Variable (n=45)	Frequency	(%)
Management		
Give eye drops\ointment	5	11.11
Give eye medication then refer	3	6.67
Eye shield/pad then refer	3	6.67
Refer immediately	29	64.44
Don't know	5	11.11
Choice of eye medication (n=6)		
TEO	5	83.33
TEO + Gentamycin	1	16.77

All the respondents were able to identify the red eye. Majority attributed it to trauma and infection by 44.44% each. On management, 64.44% would give eye medication only. Most (66.67%) of the respondents mentioned and specified which eye medication they would give. Majority (46.67%) of them would give tetracycline eye ointment alone (Table 9).

Table 9: Knowledge and practice in management of red eyes in a child

Variable (n=45)	Frequency	(%)
Signs identified in the picture*		
Red eyes	45	100
Eye discharge	1	2.22
Swollen eyes	2	4.44
Tearing	8	17.78
Diagnosis*		
Trauma	20	44.44
Allergic conjunctivitis	17	37.78
Foreign body	8	17.78
Infection	20	44.44
Management		
Give eye drops\ointment only	29	64.44
Eye drops\ointment + eye pad	1	2.22
Eye medication then refer	5	11.11
Refer immediately	5	11.11
Systemic antibiotics	5	11.11
Choice of eye medication (n=30)		
Gentamycin only	6	20.00
Steroids only	5	16.67
Steroids + Gentamycin	2	6.67
TEO only	14	46.67
TEO + Gentamycin	1	3.33
TEO + Steroids	1	3.33
TEO + Steroids + Gentamycin	1	3.33

* Multiple responses allowed

Most (84.44%) of the PHW said they were able to identify a child with poor vision. Wearing of spectacles was grossly associated to poor vision by 80% of the respondents though only 6.67% mentioned refractive error. Referral for evaluation and management was preferred by majority (77.78%) of the respondents. Use of spectacles in children would be advocated by 71.11% of PHW (Tables 10 and 11).

Table 10: Knowledge in poor vision and refractive error

Variable (n=45)	Frequency	(%)
Ability to identify a child with poor vision		
Yes	38	84.44
No	7	15.56
How to identify poor vision (n=38)		
History/complaints	10	26.32
Observation	3	7.89
Both*	25	65.79
Conditions attributed to a child wearing spectacles		
Refractive error	2	4.44
Myopia	3	6.67
Poor vision	36	80.00
Blindness	3	6.67
Don't know	1	2.22
Is the condition treatable?		
Yes	39	86.67
No	3	6.67
Don't know	3	6.67

* Multiple responses allowed.

Table 11: Practice in management of refractive error

Variable (n=45)	Frequency	(%)
Management of refractive errors		
Reassure	1	2.22
Observe then refer if no improvement	1	2.22
Refer to eye clinic for evaluation and management	35	77.78
Advice on spectacles	6	13.33
Refer for surgery	2	4.44
Advocate for use of spectacles in children		
Yes	32	71.11
No	13	28.89
Reasons for not advocating for spectacles (n=13)		
Will cause worsening of vision/blindness	7	53.85
Stigmatization	1	7.69
Children would break spectacles	5	38.45

A slight majority (66.67%) of PHW said they were able to identify a child with eye manifestations of vitamin A deficiency. They mainly relied on history of night blindness (93.33%). Only 11.11% of PHW gave the correct schedule of administering vitamin A as part of

treatment (Table 12). Childhood eye disease manual was used by 4.44% of the PHW while 35.56% would fill eye section in MCH booklets (Table 13).

Table 12: Knowledge and practice in management of vitamin A deficiency

Variable (n=45)	Frequency	(%)
Are you able to identify a child with eye manifestations of vitamin A deficiency?		
Yes	30	66.67
No	15	33.33
Signs/ symptoms (if Yes)* (n=30)		
Poor vision especially at night	28	93.33
Bitot's spot	8	26.67
Corneal scar	1	3.33
Management of vitamin A deficiency*		
Vitamin A	26	57.78
Vitamin A day 1, day 2 & week 4	5	11.11
Refer immediately to eye clinic for intervention	4	8.89
Don't know	6	13.33
Advice on food rich in Vitamin A	6	13.33
Give multivitamins	1	2.22
Refer to a nutritionist	1	2.22
Participation on nutrition education on Vitamin A supplementation		
No	14	31.11
Yes	31	68.89
Reasons for not participating in nutrition education (n=14)		
No time	6	42.86
No prior experience	4	28.57
Don't have teaching material	2	14.29
Language barrier	2	14.29

* Multiple responses allowed

Table 13: Use of Kenya childhood eye disease manual/ Kenya MCH booklets

Variable (n=45)	Frequency	(%)
Use Kenya childhood eye diseases manual		
Yes	2	4.44
No	43	95.56
Reasons for not using manual (n=43)		
Not available	30	69.77
Not aware of it	13	30.23
Filling of eye section for all children in the new Kenya MCH booklets		
Yes	16	35.56
No	29	64.44
Reasons for Not filling the eye section (n=29)		
Not available	6	20.69
No time to examine the eye	1	3.45
Only for those with eye problems	5	17.24
No prior experience	11	37.93
Not aware	5	17.24
Done in MCH	1	3.45

Using five-level likert scale, most respondents believe that childhood ocular disorders could lead to loss of vision except for strabismus which had a positive response of only 8.89% (Table 14).

Table 14: Attitude on childhood ocular disorders with regard to loss of vision using five-level likert scale

Variable n=45	Do you think the conditions below can lead to loss of vision?				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Opthalmia neonatorum	20 (44.44%)	18 (40.00%)	5 (11.11%)	2 (4.44%)	-
Glaucoma	16 (35.56%)	7 (15.56%)	20 (44.44%)	1 (2.22%)	1 (2.22%)
Strabismus	1 (2.22%)	3 (6.67%)	17 (37.78%)	13 (28.89%)	11 (24.44%)
Leukocoria	40 (88.89%)	3 (6.67%)	1 (2.22%)	-	1 (2.22%)
Corneal ulcer	32 (71.11%)	7 (15.56%)	6 (13.33%)	-	-
Red eyes	13 (28.89%)	22 (48.89%)	5 (11.11%)	4 (8.89%)	1 (2.22%)
Refractive error	16 (35.56%)	11 (24.44%)	18 (40.00%)	-	-
Vitamin A deficiency	33 (73.33%)	10 (22.22%)	1 (2.22%)	-	1 (2.22%)

DISCUSSION

It is a major concern that only one (2.22%) of health workers had post qualification training in primary eye care, which was for a duration of five days. This is a major hindrance in basic understanding of eye disorders for prompt management or referral. Often the eye care training given as part of diploma or certificate qualification is not adequate to deliver quality eye care services⁴.

Adequate knowledge and good practice on childhood ocular disorders is very crucial among PHW as it would determine the course of management and outcome. In this study, the level of knowledge varied depending on the area of assessment.

This study showed that even though majority had moderate knowledge regarding signs and risk factors, they exhibited poor knowledge in making accurate diagnosis for ophthalmia neonatorum. Only 23 (51.11%) accurately diagnosed ophthalmia neonatorum and 13 (28.89%) vaguely mentioned eye infection although 66.67% were able to identify both purulent discharge and swollen eyelids. Majority (68.89%) of the health workers mentioned infected birth canal as a risk factor for ophthalmia neonatorum. None mentioned premature rupture of membrane, prolonged labour or contaminated linen.

The practice in treatment was use of eye medication only (40%) while others (37.78%) would clean the eyes followed by eye medication. Only 8.89% of the respondents reported that they would clean the affected eyes then give both eye medication and systemic antibiotics which is generally the recommended approach. A study done in Meru and Kisumu districts in Kenya showed that a higher percentage (95.2%) of health workers correctly diagnosed ophthalmia neonatorum and 100% knew how to treat by using antibiotics eye drops or ointment⁵. There is great need to emphasize that in ophthalmia neonatorum, infection is not only confined to the eyes but may have systemic involvement thus need to add systemic antibiotics to cleaning the eyes and use of eye antibiotics. The most common eye medication mentioned among the health workers was TEO (93.33%).

The general trend in prevention of ophthalmia neonatorum was application of TEO to newborns (48.89%), prompt treatment of infections in antenatal mothers (48.89%) and cleaning eyes soon after birth (42.22%). This means probably over 50% of the health workers interviewed would not apply TEO on newborns. The practice is generally poor compared to a study conducted in Meru and Kisumu which showed that 73% of the respondents would use TEO on newborns and 74% would do antenatal screening for mothers as preventive measures⁵.

There was generally poor knowledge on congenital glaucoma. Even though 60% of the respondents were able to identify corneal haziness, only 6 (13.33%) gave the correct diagnosis and 32 (71.11%) did not know if the condition was treatable. Five (11.11%) of the respondents apparently mentioned cataract as the diagnosis which

probably indicates poor understanding of ocular anatomy. A study done in Ethiopia showed that glaucoma was barely known among the Health Extension Workers (HEW), only 16% had heard the word glaucoma but none of them knew what it was⁹.

Most of the respondents (71.11%) said they would immediately refer a child with glaucoma although only 13.33% knew the diagnosis. The effectiveness of the referrals may be put to test as caregivers are unlikely to be given proper explanation and counselling regarding the disease and its effects on vision. In addition, 28.88% of the PHW would not refer immediately. Only 4 (8.88%) would give eye medication but were unable to specify.

Most (80%) of the health workers correctly diagnosed strabismus. This closely compares to 80.7% found in the study done in Meru and Kisumu⁵. However, only 17 (37.78%) knew that the condition was treatable. In terms of management, 29 (64.44%) would refer immediately and only 8 (17.78%) knew the condition might require surgery. Squint was appropriately managed by 79.6% of the PHW in a study done in Meru and Kisumu⁵. A pilot study in Kilimanjaro region (Tanzania) showed that 38% of the PHW recognized squint as needing referral⁸. It is surprising that one of the respondents chose administration of vitamin A as the preferred treatment.

Most (91.11%) of the respondents were able to identify leukocoria correctly. Among them, 46.67% mentioned white eye reflex while 44.44% identified it as lens opacity. Majority (64.44%) attributed the condition to cataract and only 3% mentioned retinoblastoma. There is poor knowledge of other possible causes of leukocoria especially retinoblastoma which is life threatening. Others mentioned vitamin A deficiency, trachoma, eye infection and glaucoma. Studies done in Mwanga District (Tanzania)⁶, Malawi⁷ and Kilimanjaro region (Tanzania)⁸ showed that 67.3%, 56% and 88% respectively identified cataract in a picture.

Most (95.55%) of the PHW interviewed would refer a child with leukocoria. This is a good attitude amongst the health workers. Out of the 29 respondents who mentioned cataract as a possible diagnosis, 96.55% would refer with a majority (58.62%) of them specifying need for surgery. All those who mentioned retinoblastoma would refer immediately. Other studies in Mwanga (Tanzania)⁶ and Kilimanjaro region (Tanzania)⁸ showed that 63.2% and 63% respectively, knew that cataract required surgery.

There was generally poor knowledge on corneal ulcer among the health workers. Only six (13.33%) of the respondents gave the correct diagnosis and two (4.44%) identified corneal ulceration in the picture. This is a major concern given that about 35.2% of visual loss in children is due to corneal pathology as shown by a study in Malawi, Uganda and Kenya¹⁰. Most (77.78%) of the PHW said they would refer immediately. However, it is only 3(6.67%) who would give eye medication then refer. Five (11.11%) respondents would just give eye medication while another 5 (11.11%) did not know what to do. It is

notable that none of those who specified eye medication would give steroids. They all said they will give TEO with one respondent combining it with gentamycin eye drop.

All the respondents were able to identify the red eye. Majority attributed it to trauma (44.44%) and infection (44.44%). Others were allergic conjunctivitis (37.78%) and foreign body (17.78%). Majority, 29 (64.44%), of the PHWs interviewed would give eye medication alone to a child presenting with red eyes. Only 5 (11.11%) would give eye medication then refer to eye clinic comparable to 14.5% found in Meru and Kisumu⁵. The commonest antibiotic mentioned was TEO (46.67%), steroids only (16.67%) and steroids antibiotics combination (13.33%) amongst others. It might be difficult for the PHW to correctly diagnose aetiology of a red eye and thus they are encouraged to give eye antibiotics and refer. Some of the treatment options like steroids may worsen the condition especially if it is due to an infection.

Most of the respondents 38 (84.44%) said they could identify a child with poor vision. However, there was moderate knowledge on identification of the poor vision with 65.79% of them mentioning use of history and direct observation only. When shown a picture of a child wearing spectacles, 36 (80%) of the respondents attributed it to poor vision, 2 (4.44%) mentioned refractive error, 3 (6.67%) myopia, 3 (6.67%) blindness and 2 (2.22%) did not know the diagnosis. This could imply that most of the health workers do not know specific indications for using spectacles as poor vision might not necessarily be due to refractive error. However, the attitude was generally good since 35 (77.78%) of the respondents would refer a child in need of spectacles to eye clinic for evaluation and further management. However, 13 (28.89%) of PHW would not advocate use of spectacles in children. Amongst this group, seven reported that spectacles could lead to worsening of vision.

Childhood blindness or visual impairment associated with vitamin A deficiency is common in low-income countries². Clear understanding of ocular manifestation and management of vitamin A deficiency in these settings need to be enhanced. In this study, 30 (66.67%) of the respondents said they were capable of diagnosing a child with ocular manifestations of vitamin A deficiency. Out of this, 93.33% mentioned poor night vision as the main symptom to aid in diagnosis. There was poor knowledge on ocular signs of vitamin A deficiency. The only ocular signs mentioned were Bitot's spot and corneal scar by just eight and one respondent respectively. These signs are very important especially when dealing with young children who may not complain of poor night vision.

The study showed that 31 (68.89%) of the respondents would give vitamin A to a child with ocular manifestations of vitamin A deficiency. However, only 5 (11.11%) would give it correctly. Most (68.89%) of PHW participate in nutrition education on vitamin A supplementation through health talks. The most common reason for not participating was lack of time. Other challenges were lack of teaching materials, poor experience and language barrier as some of the PHW do not understand the local language.

The Kenya childhood eye disease manual/ Kenya MCH booklets help to guide health workers in managing various childhood disorders including eye diseases. It enables identification of children with specific childhood eye diseases and thus prompt treatment or referral. It is of great concern that only 2 (4.44%) of the respondents use Kenya childhood eye diseases manual. Out of the 43 (95.56%) who do not use, 30 (69.77%) reported that they did not have the manuals while the remaining 13 (30.23%) were not even aware of its existence.

Majority of the respondents (64.44%) do not fill eye section for all children in the new Kenya MCH booklets. It is only 16 (35.56%) who reported that they fill in appropriately. The main reason for not filling was lack of prior experience. It is a great concern that 5 (17.24%) of those who do not fill indicated that they were not aware of existence of that section while 6 (20.69%) did not have the booklets. A study in Meru and Kisumu (Kenya) showed that the section on identification of early eye problems was completed in only 0.8% of 330 booklets sampled⁵. Although this study showed that 16 (35.56%) of the respondents do fill the MCH booklets appropriately, it can only be verified by examining actual MCH booklets of children attending the MCH clinic.

Generally over 50% of the respondents believe that the childhood ocular conditions could lead to visual loss. However, the exception was with squint where 53.33% disagreed at various levels while 37.78% were neutral.

Most (71.11%) respondents would advocate use of spectacles in children. About half (53.85%) of those who would not, believe spectacles would worsen vision leading to blindness. This myth needs to be eliminated as it is likely to deter management of children who have refractive error, considering that uncorrected refractive errors account for 12 million (63.16%) of 19 million children who are visually impaired worldwide¹¹.

CONCLUSION AND RECOMMENDATIONS

Participants had generally good knowledge in diagnosis of ophthalmia neonatorum, squint, and red eyes but poor in glaucoma, leukocoria, corneal ulcer, refractive error and ocular signs of vitamin A deficiency. Most PHW were positive that childhood ocular disorders could lead to vision loss except for squint. They also showed good advocacy for use of spectacles in children. The practice was good in squint, glaucoma, refractive error and leukocoria but poor in ophthalmia neonatorum, corneal ulcer, red eyes, vitamin A deficiency and use of guidelines/MCH booklets.

There is need to encourage and facilitate post-qualification training, continuous medical education and regular supervision with regard to PEC among PHW. Enhance sensitization among PHW about the MCH and childhood eye disease manual coupled by routine auditing/sampling of filled MCH booklets and distribution of adequate childhood ocular disorders guideline to all health facilities.

More research is needed to cover other parts of the country so as to give the national picture on the level of knowledge, attitude and practice among PHW on childhood eye disorders.

ACKNOWLEDGEMENT

The study was funded through sponsorship from Christian Blind Mission (CBM).

REFERENCES

1. John W. Simon, Pamela KAW. Albany Medical College, Albany, *New York Am Fam Physician*. 2001 Aug 15; **64**(4):623-629.
2. WHO. Vision 2020 Priority Eye Diseases. <http://www.who.int/blindness/causes/priority/en/index4.html>
3. Gilbert C, Haroon A. Blindness in children. *BMJ*. 2003; **327**(7418): 760–761.
4. Ravilla TD, Ramasamy D. Advocacy for eye care. *Indian J Ophthalmol* 2012; **60**:376-379.
5. Gichangi M. Knowledge and practice of caregivers and health care workers regarding common eye diseases in children, 2011(unpublished).
6. Byamukama E, Courtright P. Kilimanjaro Christian Medical College, Tumbaini University, Moshi, Tanzania. Kilimanjaro Centre for Community Ophthalmology, Moshi, Tanzania.
7. East African Task shifting AHSI research team for assessing the productivity and quality of eye care services to assist decision making, March 2011.
8. Elizabeth K, Margreet H, Marjolein D, *et al*. Is the existing knowledge and skills of health workers regarding eye care in children sufficient to meet needs?
9. Yewubnesh H, Abeba T, Assegid A. Know-how of primary eye care among Health Extension Workers (HEWs) in Southern Ethiopia. *Ethiop J Health Dev*. 2009; **23**(2):
10. Gilbert CE, Wood M, Waddel K, *et al*. Causes of childhood blindness in East Africa: results in 491 pupils attending 17 schools for the blind in Malawi, Kenya and Uganda. *Ophthalmic Epidemiol*. 1995; **2**(2):77-84.
11. Visual impairment and blindness, <http://www.who.int/mediacentre/factsheets/fs282/en/>