KNOWLEDGE AND PRACTICE OF PRIMARY EYE CARE AMONG PRIMARY HEALTHCARE WORKERS IN BUNGOMA COUNTY

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H58/33589/2019

A RESEARCH REPORTSUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF MEDICINE IN OPHTHALMOLOGY OF THE UNIVERSITY OF NAIROBI

MAY, 2023.

DECLARATION

I declare that this research report is my original work and has not been presented for the award of a degree in any institution of higher learning.

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Supervisors' approval

This research report has been submitted for review with our approval as university supervisors for the Masters of Medicine in Ophthalmology

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Dedication

I dedicate this work to my father Mr. Samuel Wamweya my late mother Mary Ng'endo, my wife Esther my daughter Natalia, and my son Gadiel for their prayers, patience, and support throughout the residency program.

Acknowledgment

I thank the almighty God for good health throughout the residency program.

I will forever be grateful to the Ministry of Health of Bungoma County for awarding me a study leave and allowing me to conduct my research within the county.

My sincere gratitude to my research supervisors Dr. Margaret Njuguna and Dr. Sheila Marco for their guidance throughout the study period.

I wish to especially thank the county of Bungoma primary healthcare workers who were involved in this study, may the almighty God bless them.

Finally, I must express my profound gratitude to my siblings Elizabeth, Margaret, John, Nancy, Lucy, Ben, Ann, and Cecilia for their prayers, unfailing moral support, and continuous encouragementthrough my years of study, research, and writing this thesis.

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LIST OF ABBREVIATIONS

CDC: Centers for Disease Control and Prevention

CO: Clinical Officer

MCH: Mother and Child Health

PEC: Primary Eye Care

PHC: Primary Health Care

PHCWS: Primary healthcare workers

SPSS: Statistical Package for Social Sciences

TEO: Tetracycline Eye Ointment

UK: United Kingdom

US: United States

VA: Visual Acuity

WHO: World Health Organization

DEFINITION OF TERMS

Knowledge: The primary healthcare worker's possession of facts and understanding of the various aspects of primary eye care.

Practice: The actual application of knowledge and skills to identify, prevent, treat, or appropriately refer patients with eye problems for further care.

Primary eye care: Primary eye care encompasses eye health promotion, disease prevention and treatment, rehabilitation, and palliative care services through primary health care.

Primary healthcare workers: Involves the workforce involved in Primary Health Care promotion and is the first contact person for patients. Includes general practitioners, clinical officers, nurses, dentists, pharmacists, laboratory technicians, nutritionists, community health workers, and traditional healers.

Health center: This is a level 3 health facility according to Kenya's health structure.

Health center staff include midwives or nurses, clinical officers, and occasionally doctors.

Dispensaries: This is a level 2 health facility according to Kenya's health structures. Staff include nurses and occasionally clinical officers.

ABSTRACT

Introduction: Primary eye care is an important part of primary health care designed to mitigate eye problems in the community. In Kenya, there is little evaluation of the knowledge and practice of the primary eye care providers in primary health care facilities. **Study objective:** To assess knowledge and practice of primary eye care among primary healthcare workers in Bungoma County**. Study methods: Study design:** A cross-sectional design was adopted. **The study population:** The study population was primary healthcare workers working in health centers and dispensaries in Bungoma County.**Sample size and the sampling procedure:** The sample size was determined using Fischer's formula. Simple random sampling technique was adopted in selecting the health facilities andall eligible and consenting participants were interviewed. **Data collection:** A self-administered questionnaire was used for data collection. **Data analysis and presentation:** Filled questionnaires were collected, cleaned, coded, and entered into SPSS version 24.0 for analysis. Results were presented in the form of charts, graphs, tables, and narrative texts. **Ethical considerations:** Ethical considerations were observed relating to confidentiality, anonymity, voluntary participation, and appropriate approvals. **Results:**A total of 91 PHCWS were enrolled in the study with nurses being 79.1% and clinical officers 20.9%. More than half of the participants (61.5%)indicated that there was no visual acuity chart in their facility and this was compounded by the fact that 65.9%of the participants could not correctly describe how to measure visual acuity.Having trained on PEC in the curriculum and having a VA chart in the facility had a significant influence on the knowledge to measure VA. Knowledge of identification of trauma, white reflex, squint, cataract, ophthalmia neonatorum, and conjunctivitis was good asthe majority (>60%) of the participantsrightly identified them. However, knowledge of the identification of presbyopia waspoor as only 12.1% of them were right. A larger proportion of the participants hadgood practice in the management of white reflex 91.2 %, squint 76.9 %, cataract 95.6 %, presbyopia 87.9 %, conjunctivitis 75.8 %, and trauma to the eye 60.4 %. However, practice in themanagement ofophthalmia neonatorum was poor as only4.4% of PHCWS knew the correct management. **Conclusion and recommendation:** It was concluded that most PHCWS from Bungoma County had good knowledge and practice of PEC.However, gaps in the same were noted. Based on that, awareness creation on various aspects of PEC including visual acuity assessment, identification, and management of early eye conditions is recommended.

CHAPTER ONE: INTRODUCTION

1.1 Background

The concept of primary health care (PHC) has been undergoing changes, redefinition, and reinterpretation since its inception in 1978.[1] However, a report by the World Health Organization developed in the year 2008 rekindled interest and drew attentionto the primary health care effectiveness in reshaping the worldwide failing health care systems.[1]PHC has recorded tremendous success in many regions of the world.[2] As one of the eleven components of primary health care, primary eye care (PEC) involves providing patients with appropriate, affordable, and accessible eyecare that meets their needs competently and comprehensively. PEC offers the patient the first contact for eye care as well as a lifetime of continuing care.It includes identifying and treating or referring individuals with treatable conditions that could lead to blindness.[3] All the principles of PHC including community involvement, fair distribution, focus on prevention, multisector approach, and appropriate technology among others, should all be adopted in primary eye care.[4]. Without PEC, only the patients presenting in secondary or tertiary health facilities will be diagnosed and treated while very little will be achieved in terms of prevention.[3]

In African countrieslike Algeria, Ethiopia, and Kenya, studies point to a state of a high prevalence of ocular diseases some being potentially blinding despite being easily treatable hence the need for PHCWS to be knowledgeable and have good practice in the PEC.[5,6,7,8,9]

1.2 Problem Statement

Primary eye care strategy was established to be effective in combating preventable and treatable ocular conditions globally. However, the level of adoption of the strategy among primary healthcare workers is varied in different regions across the globe hence, the varied prevalence of advanced ocular conditions including blindness.[8]

The apparent absence of effectiveness by primary healthcare workers in adopting and implementing primary eye care services at the grass-root level across Africa was recorded in a study by Kila et al.[10]. A thorough literature search revealed no literature on prior similar studies conducted across Bungoma County.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The idea of primary eye care was introduced in Alma Ata after it was discovered that some components of PHC could have a significant effect on lowering two of the major causes of blindness in developing countries and regions across the globe: trachoma and vitamin A deficiency-related eye disease. Tetracycline eye ointment (T.E.O), chloramphenicol, and vitamin A were introduced in the basic eye facilities and cheaply available medicines were recommended to treat basic eye ailments. The scope of primary eye care was expanded when it was discovered thatprimary healthcare workers, with limited equipment, can be taught to identify a cataract and a red eye which often indicates many different vision-threatening problems.[11] With the added skill of measuring visual acuity, it was realized that a great deal of important ocular conditions could be recognized, treated, or referred appropriately atthe primary healthcare level thereby strongly contributingtoblindness prevention. The concept of primary eye care, globally, became popular with both governmental and non-governmental organizations (NGOs) and is noted as an important part of eye care especially in middle- and low-income countries.[12]

Primary eye care activities are categorized into the clinical component and the eye health promotive component with both components recognizing the three groups of community members in need of primary eye care services including screening; the healthy individual, an individual with a certain eye disease, and lastly an individual at risk of eye disease[13]. For the clinical components, the community diagnosis should precede PEC and thus give a different outlook oneye health.[14]

2.2 Knowledge of primary eye care

 A primary healthcare worker's daily routine includes identifying and managing various illnesses in patients in the community-level setting including those that affect the eyes. It is therefore imperative that they possess adequate knowledge ofthe various aspects of primary eye care.[15]PHCWS alsoought to be well versed with the primary eye care guidelines by the World Health Organization and those specific to individual countries. If the guidelines are diligently adopted and applied in daily practice, it would provide a significant avenue for getting eye diseases and disorders in the early stages before they advance to blinding stages.[16] As a result of this responsibility among primary healthcare workers including clinicians and nurses, there is a critical concern regarding their level of knowledge and awareness of various aspects of primary eye care.[17]

Globally, the level of knowledge regarding primary eye care among primary healthcare workers has varied. While adequate knowledge and awareness have been established to be present amongprimary healthcare workers in developed countries such as the United States and the United Kingdom, the few studies conducted in developing countries have generally realized lower knowledge levels. For instance, in a study conducted in Wales, it was found that primary healthcare workers were knowledgeable on PEC and even went further to train what they referred to as community champions who went deeper into communities delivering eye health messages.[18]

A study done among slightly over one hundred primary healthcare workers in thirty-five primary health facilities in Eastern Nepal established low primary eye care knowledge among the workers. Out of all the 107 primary healthcare workers who participated in the study, less than a tenth had received on-the-job primary eye care training. On the knowledge of thecommon ocular conditions, slightly over a quarter could diagnose a corneal ulcer, three-quarters could diagnose a cataract, and half could diagnose ophthalmia neonatorum while a majority were able to diagnose conjunctivitis. On visual acuity knowledge and skills, only 14 % of the workers could correctly measure visual acuity. The study concluded that the primary eye care knowledge and skills amongprimary healthcare workers in eastern Nepal were inadequate to provide sufficient primary eye care services. There was, therefore, a need for more training on the same.[19]

Training of primary healthcare workers on various components of primary eye care has been inadequate in most regions across the globe and this has had a negative implication on the workers' knowledge and skills necessary for provision of PEC services. While extensive efforts have been made and positive results achieved in training and equippingprimary healthcare workers with necessary knowledge in developed countries, developing countries, especially in sub-Saharan Africa are still lagging.[20] Rebecca,[21] for instance realized that in Liberia, while almost all the primary healthcare workers affirmed that they provided primary eye care services to patients in their respective primary health care facilities across the country, only a few had adequate knowledge of various aspects of the primary eye care as only a small percentage of them had been trained o the various aspects of PEC. In a similar study in Malawi, Tanzania, and Kenya, the knowledge of theprimary healthcare workers was found to be alarmingly low. One of the reasons identified behind the inadequate knowledge was the lack of on-the-job training on primary eye care practice as the percentage that received the training across the four countries was low.[22] The

fact that the primary healthcare workers were providing PEC services to patients at the grassroots level while possessing little to no knowledge of the specific components of the practice was an example of overstepping of competence which is detrimental to the eye health of members of the community served.[21]

A cross-sectional study done in a rural district in Nigeria involving eighty-eight primary healthcare workers revealed that the participants only had an average level of knowledge and practice inprimary eye care. Although more than half of the participants were able to correctly diagnose a cataract, conjunctivitis, and eye trauma none of them could recognize vitamin A deficiency. Additionally, a majority were not able to identify the most significant features of the common conditions. Their ability to recognize common eye conditions and the specific management was graded as weak and their practice was non-adherent to the stipulated guidelines.[23]In a similar study conducted in Tanzania, the primary healthcare workers were found to have little understanding of common eye conditions and assessment of visual acuity. Additionally, the study revealed that there existed a relationship between training and knowledge and skills level, suggesting a need for a review of the curriculum and an introduction of supervisory procedures.[24]

2.3 Practice in the Primary Eye Care

Primary eye care comprises vast aspects of eye care that aim to, among other things, prevent and treat diseases that can lead to blindness.[25] Primary eye care aims at changing the pattern of eye care services that are currently limited to secondary and tertiary health facilities and designated eye units in larger towns and cities to countrywide ocular disorders prevention programs.[26]

Correct treatment of common ocular conditions is a major practice that primary healthcare workers ought to know if they are to offer effective eye care to their clients. However, this is not always so as several studies have realized that primary healthcare workers cannot treat common ocular conditions, some with a potential for blindness. For instance, a study by Universal Eye Health, revealed that important diagnostic characteristics of certain ocular diseases were rightly recognized in the questionnaire but missed on images presented[27]. Possible explanations for this could be that the primary healthcare workers knew the ocular diseases only in theory, and not in practical aspects, and this could impair their practice in the PEC.

A study in Nepal revealed that among the study sample, more than half knew the right treatment for cataract surgery, a majority would treat conjunctivitis with antibiotics, would initiate treatment then refer a corneal ulcer, would initiate treatment for ophthalmia neonatorum then refer if no improvement. However, only a smaller portion of the health care workers were able to correctly take visual acuity at 6 meters and do each eye separately.[19]

Other literature has been documented on the adequacy of eye care in PHC systems around the world. For instance, it was established that there was minimal practice of primary eye care among primary healthcare workers in Tanzania.[28] In Ethiopia, research established that the primary healthcare workers mainly practiced preventive aspects of primary eye care while the other aspects were foregone.[29]

A study conducted across three countries in the East African region namely Malawi, Tanzania, and Kenya, indicated that only 8.2 % of the 343 primary healthcare workers had adequate skills and knowledge of primary eye care practice. The proportion of PHCWS with "competence" (full points) in each of the components, used for studies in Tanzania, Kenya, and Malawi, was average for cataract and trauma, low for presbyopia, and conjunctivitis, and very low for measuring VA. Less than 3% of PHCWS could demonstrate competence in all components together in the named countries. Only a smaller portion could measure the visual acuity.[22]

In Nigeria, although slightly more than half of the primary healthcare workers studied would refer a cataract for surgery, half would treat conjunctivitis with antibiotics, and another half would refer eye trauma patients, none would treat vitamin A deficiency properly since they couldn't diagnose it in the first place. Also, only a smaller portion were able to measure visual acuity correctly.[23]A similar study in Tanzania revealed that although more than halfof the study participants could refer cataract patients for surgery, treat conjunctivitis with antibiotics, refer eye injury patients, and treat presbyopia with spectacles, only 6% could measure visual acuity correctly.[24]

2.4 Justification of the study

According to the Kenya County Climate Risk profile, Bungoma County is 90 % rural. Availability and uptake of PEC service in rural areas, as Bungoma County is largely rural, is an important indication of the effectiveness of the efforts towards the promotion of PEC. The uptake of PEC in most rural settings is a clear indication that the intervention has attained countrywide coverage. It

was, therefore, critical to assess knowledge and practice of PEC across this specific county if a clear grassroots level picture of the PEC practice was to be depicted.

2.5 Research questions

1. What is the knowledge of various aspects of primary eye care service among primary healthcare workers in primary healthcare facilities in Bungoma County?

2. Can the primary healthcare workers in primary healthcare facilities across Bungoma County identify, treat, and/or appropriately refer patients with eye problems to higher-level facilities for further care?

2.6 Study objectives

2.6.1 Broad objective

To assess knowledge and practice of primary eye care among primary healthcare workers in Bungoma County.

2.6.2 Specific objectives

1. To assess the level of knowledge of thePHCWS in Bungoma County on various aspects of primary eye care including identifying common eye conditions.

2. To assess practice in the management of primary eye care conditions among PHCWS in PHC facilities in Bungoma County.

CHAPTER THREE: STUDY METHODS

3.1 Study design

This was a cross sectional study design.

3.2 Study Area
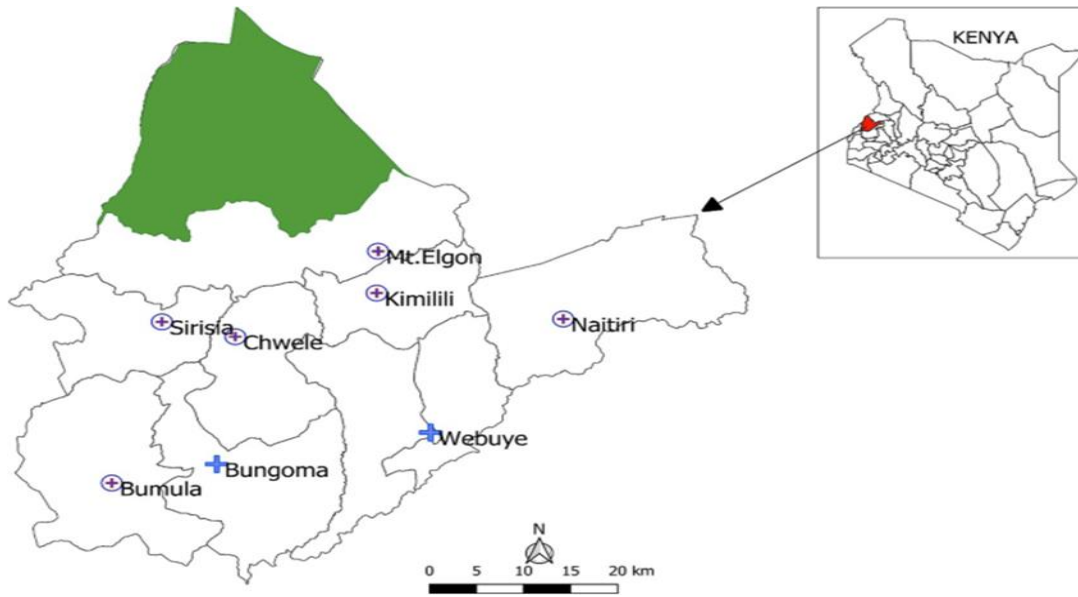
Figure2Study Area

The study was done in Bungoma County which is one of the forty-seven counties in Kenya. It is located in the former Western Province and made up of nine sub-counties namely Bumula, Kimilili, Kabuchai, Kanduyi, Mt. Elgon, Webuye West, Webuye East, Sirisia, and Tongaren, and 45 county electoral wards. According to the 2019 Kenya Population and Housing census, the county was home to 1, 670, 570 inhabitants.[30] Concerning the health sector, reports by the Commission for the Implementation of the Constitution,[31]indicated that the county had 10 hospitals (County and Sub County) 16 health centers, and 88 dispensaries distributed as follows;

Table2: Number of health centers and dispensaries in Bungoma County

Sub County	Health centers	Dispensaries
Bumula	2	7
Kabuchai	3	10
Kanduyi	2	9
Kimilili	1	10
Mt. Elgon	2	9
Sirisia	1	7
Tongaren	2	14
Webuye East	1	10
Webuye West	2	12
Total	**16**	**88**

3.3 Study Population

The study population was the clinical officers and nurses working in Health Centers and dispensaries across Bungoma County. According to reports by the Commission for the Implementation of the Constitution[31], Bungoma County has 16 health centers served with an average of 10 nurses and 2 clinicians each and 88 dispensaries served with an average of 2 nurses each.

3.4 Eligibility criteria

3.4.1 Inclusion criteria

Nurses and clinicians working in health centers and dispensaries across Bungoma County were included. The nurses and clinicians who signed the informed consent form were interviewed.

3.4.2 Exclusion criteria

Nurses and clinicians on leave and days off were excluded.

3.5 Sample size determination

The sample size was determined using Fischer's formula.

$$n= Z^2p (1-p)/d^2$$

n= estimated sample size

Z= Standard normal deviate for 95 % confidence interval (1.96)

p= proportion of clinicians and nurses with adequate PEC knowledge/skills (51.7 %/ 0.517). (The proportion was determined from the prevalence of knowledge/skills about PEC at 0.52 by Byamukama & Courtight[24] in Tanzania where they assessed knowledge and skills on PEC among nurses and clinicians).

d= desired level of precision set to 0.05

$$= [1.96^2 x0.52 (1-0.52)]/0.05^2$$

$$= 383.54$$

Because the target population was less than 10,000, a correlational factor (nf) was applied.

Nf=n/(1+n/N)

nf= computed sample size when the target is <10,000

N= the total target population was approximately 18 COs and 90 nurses. Each health center had an average of 2 COs and 6 nurses while each dispensary was served with an average of 2 nurses.

Sample size for COs= 383.54/ (1+383.54/18) =17

Sample size for nurses= 383.54/ (1+383.54/90) = 72

The minimum sample size for COs was therefore 17 and 72 for nurses.

3.6 Sampling technique

Simple random sampling was used to select health facilities and all eligible and consenting participants were interviewed.

Stage 1a: One Health Center from each sub-county was randomly selected by balloting method where facility names were written on small papers, rolled, shuffled, and randomly picked.

For sub-counties with only one health center, for instance, Sirisia, the health center was automatically selected.

Stage 1b: Two dispensaries were randomly selected from Sub-Counties with less than 10 dispensaries while 3 were selected from Sub Counties with more than 10. This was also done via the same balloting method as above. For instance, in Sirisia two dispensaries were selected from a total 7 dispensaries, and in Tongaren three were selected from a total of 14.

Stage 2: All COs and Nurses on duty and consented to the study were interviewed.

Table 2 Distribution of the selected health centers and dispensaries

Sub county	Health Center	Dispensaries
Bumula	Kabula	Myanga, Kibuke
Sirisia	Malakisi	Bisinu, AC Butonge
Kanduyi	Mechimeru	Ranje, Mayanja
Mt. Elgon	Sacha	Chepkitale, Kapchebon
Tongaren	Tongaren	Eluuya, Makhanga, Sango
Kabuchai	Nalondo	Sikusi, Nasaka, Luucho
Kimilili	Makhonge	Sulwe, Kamukywa, Maeni
Webuye West	Milo	Misikhu, Kituni, Matisi
Webuye East	Webuye health center	Mihuu, Sinoko, Khaoya
Total	**9**	**23**

3.7 Data collection instruments and procedures

3.7.1 Data collection instrument

The study instrument was provided in Appendix V. A researcher-designed self-administered questionnaire was the study instrument.

3.7.2 Data collection procedures

After the introductions to the hospital administration, the study and its purpose were explained to them in every health facility, who then directed and introduced the researcher to the primary healthcare workers at the facility. Consent forms where matters of voluntary participation, privacy, anonymity, and confidentiality were explained were handed to them for their perusal before answering any question asked. Those willing to participate were then given the consent certificate form for signing. The researcher and the trained research assistants then handed the participants the questionnaires to fill. Data collection was done during break times when the nurses and the clinicians were not providing care to their clients. The questionnaire took an average of 20 minutes per participant to be completed. The filled questionnaires were then collected and stored safely in preparation for data entry and the analysis process.

3.7.3 Validity and reliability

Data quality was incorporated in the entire study process especially at the data collection point to include completeness of questionnaires, legibility of records, and validity of responses. At the data processing point, quality control included; data cleaning, validation, and confidentiality. There were three types of validity that were addressed and stated; face validity with pre-testing of survey instruments, content validity by the use of expert opinions, and literature searches.

The methods that were used in estimating reliability were the use of measures of internal consistency. Ten questionnaires were pre-tested through a pretest study with individuals in the study excluded from the main study to avoid double inclusion. Their feedback helped in making vital adjustments to enhance the reliability and validity of the study tool and overall, the findings.

3.8 Data management, analysis and presentation

Filled questionnaires were collected, cleaned, coded, and entered into SPSS version 24.0 for analysis. Frequencies and percentages were calculated for the descriptive data while for the inferential statistics, a chi-square test of significance was run to check for relationships between variables. The p-value was set at 0.05.

3.9 Ethical Considerations

Ethical approval for the study was sought from the University of Nairobi-Kenyatta National Hospital Ethics and Research Committee. Permission to collect data was sought from Bungoma County director of Health. The nature and purpose of the study were adequately explained to potential participants. Confidentiality was maintained on the identity of the participant by using numbers rather than names. Each questionnaire was assigned a random code for identification. All information given in the form of responses to the questionnaire was treated with the utmost confidentiality.

3.10 Dissemination of findings

The findings will be disseminated to the County Administrator Department of Health, Bungoma County,and the University of Nairobi, Department of Ophthalmology.

CHAPTER FOUR: RESULTS

4.0 Results

A total of 91 PHCWS participated in the study and all were interviewed using self-administered questionnaire. They were drawn from 16 Health centres and 23 dispensaries across Bungoma County.

```
                    Bungoma county
                          |
                    9 subcounties
                   /              \
      16 Health Centers          88 dispensaries
         9 selected                23 selected
            |            _____/      \
      19 Clinical Officers |         72 Nurses
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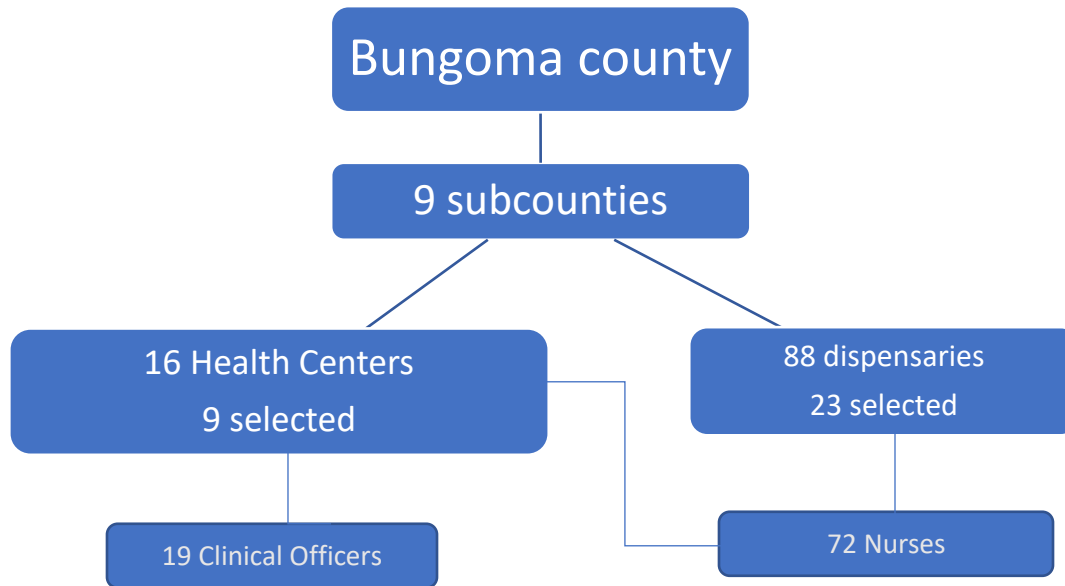
Figure 2 Distribution of interviewed PHCWS

4.1 Demographic characteristics of the PHCWS

Among the 91PHCWS, 49(53.8 %) were between the ages of 26 to 35 years. The mean age was 34.68 years and they ranged from 23-56 years.Female participants were 46(50.5%) and male 45(49.5%) giving a ratio of 1:1. Nurses were 72(79.1 %). A total of 61(67.1%) PHCWS had a work experience of less than 10 years. In general, 75(82.4%)PHCWS affirmed that they were trained on primary eye care in the college curriculum.Out of the 91 PHCWS, 47(51.6 %) had attended on-the-job training on primary eye care while 44(48.4%) had not.

Table 3 Demographic characteristics of the PHCWS(N=91)

Variable	Frequency	%
Age groups (year)		
20-30	29	31.9
30-40	49	53.8
>40	13	14.3
Gender		
Female	46	50.5
Male	45	49.5
Profession		
Clinical officer	19	21.9
Nurse	72	79.1
Work experience (years)		
<5	31	34.1
6-10	30	33.0
11-15	23	25.3
>15	7	7.7
Curriculum training on PEC		
Trained	75	82.4
Not trained	13	14.3
Can't remember	3	3.3
On-the-job training		
Trained	47	51.6
Not trained	44	48.4

Among the trained PHCWS, 19(100%) COs reported to have been trained on PEC in their curriculum as compared to 56(77.8%) nurses. However, for the on-the-job training, only 9(47.4 %) COs and 38(52.8%) nurses reported being trained.
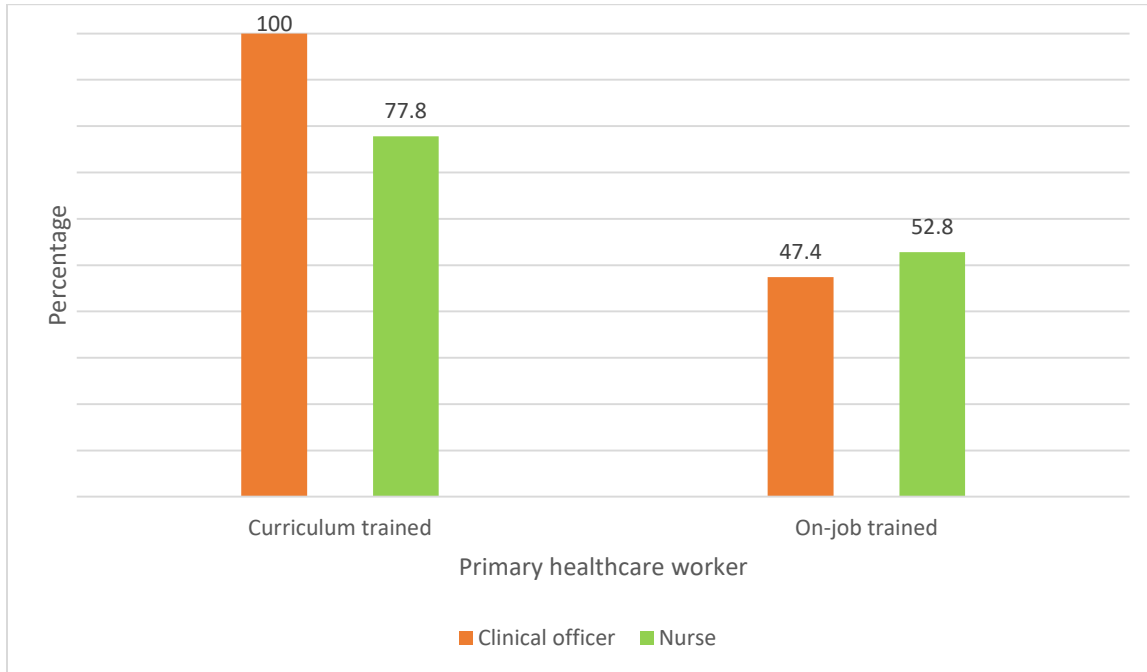
Figure 3Distribution of COs (n=19) and Nurses (n=72) by curriculum and on-the-jobtraining on PEC

4.2 KNOWLEDGE OF THE PEC AMONG THE PHCWS

4.2.1 PHCWSknowledge of assessing visual acuity

A total of56(61.5%)participantsindicated that there was no visual acuity chart in their facility. Only 31(34.1%)correctly described the correct distance and covering of one eye when taking vision while22(24.2%) described the correct distance only.

Table 4PHCWS description on assessing visual acuity

Parameter	Response	Number of PHCWS	Percentage (%)
Is there a visual acuity chart in your facility	Yes	31	34.1
	No	56	61.5
	Don't know	4	4.4
	Total	**91**	**100**
Briefly describe how you measure visual acuity in an adult patient	Aware	31	34.1
	Unaware	60	65.9
	Total	**91**	**100**

4.2.2PHCWS factors associated with measuring of visual acuity (N=91)

There was a significant association betweenthe availability of a visual acuity chart in the facility (p= 0.038), on-the-job training on PEC (p= 0.008),training on PEC in the curriculum (p= 0.002), and the PHCWSknowledge of how to measure visual acuity.

Table 5PHCWS factors associated with measuring of visual acuity (N=91)

Variable	Measure of visual acuity		p-value
	Correct n (%)	Incorrect n (%)	
Were you trained on PEC in your college curriculum			
Yes	31(41.3)	44(58.7)	**0.002**
No	0(0.0)	16(100.0)	
Is there a visual acuity chart in your facility			
Yes	15(48.4)	16(51.6)	**0.038**
No	16(26.7)	44(73.3)	
Have you attended an on-the-job training on PEC			
Yes	22(46.8)	25(53.2)	**0.008**
No	9(20.5)	35(79.5)	

4.2.3PHCWSKnowledge of identification of eye conditions

Trauma to the eyeand cataractwerecorrectly identified by82(90.1%) participants while only 11(12.1%)participantsidentified presbyopia
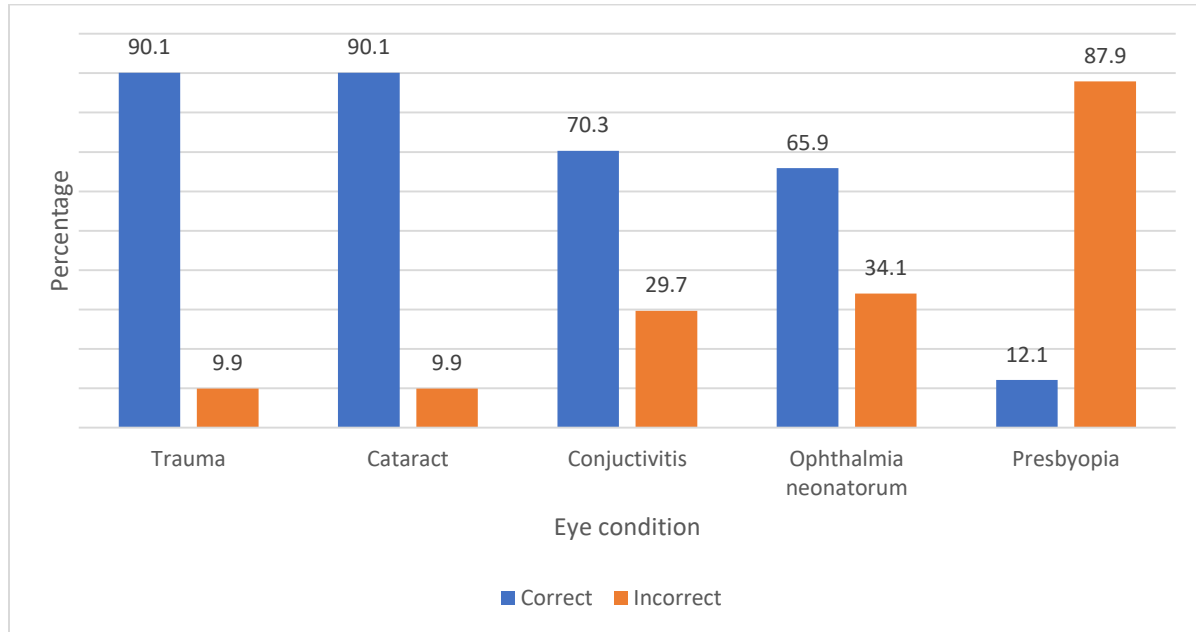
Figure 4PHCWSKnowledge of identification of eye conditions (N=91)

4.2.4 Relationship between PHCWScharacteristicsand knowledge of identification of selected primary eye conditions

There was not a statistically significant relationship between gender, profession, work experience, or on-the-jobtraining on PEC and knowledge of identification of trauma.

Table 6 Relationship between PHCWScharacteristics and knowledge of identification of trauma.(N=91)

Characteristic	Knowledge of identification of trauma		
	Correct n(%) Incorrect n(%)		p-value
Gender			
Female	41(89.1) 5(10.9)		0.752
Male	41(91.1) 4(8.9)		
Profession			
CO	18(94.7) 1(5.3)		0.442
Nurse	64(88.9) 8(11.1)		
Work experience (Years)			
<5	27(87.1) 4(12.9)		
6-10	26(86.7) 4(13.3)		
11-15	22(95.7) 1(4.3)		0.517
>15	7(100.0) 0(0.0)		
On-the-jobtraining on PEC			
Yes	43(91.5) 4(8.5)		0.649
No	39(88.6) 5(11.4)		

There was not a statistically significant relationship between gender, profession, work experience, or on-the-jobtraining on PEC and knowledge of identification of a cataract.

Table 7 Relationship between PHCWScharacteristics and knowledge of identification of cataract.(N=91)

Characteristic	Knowledge of identification of cataract		
	Correct n(%)	Incorrect n(%)	p-value
Gender			
Female	41(89.1)	5(10.9)	0.752
Male	41(91.1)	4(8.9)	
Profession			
CO	17(89.5)	2(10.0)	0.109
Nurse	65(90.3)	7(9.7)	
Work experience (Years)			
<5	27(87.1)	4(12.9)	
6-10	27(90.0)	3(10.0)	
11-15	21(91.3)	2(8.7)	0.772
>15	7(100.0)	0(0.0)	
On-the-job training on PEC			
Yes	43(91.5)	4(8.5)	0.649
No	39(88.6)	5(11.4)	

There was not a statistically significant relationship between gender, profession, work experience, or on-the-jobtraining on PEC and knowledge of identification of presbyopia.

Table 8Relationship between PHCWScharacteristics and knowledge of identification of presbyopia.(N=91)

Characteristic	Knowledge of identification of presbyopia		
	Correctn(%) Incorrect n(%)		p-value
Gender			
Female	8(17.4) 38(82.6)		0.117
Male	3(6.7) 42(93.3)		
Profession			
CO	2(10.5) 17(89.5)		0.681
Nurse	9(12.5) 63(87.5)		
Work experience (Years)			
<5	3(9.7) 28(90.3)		
6-10	4(13.3) 26(86.7)		
11-15	3(13.0) 20(87.0)		0.966
>15	1(14.3) 6(85.7)		
On-the-jobtraining on PEC			
Yes	7(14.9) 40(85.1)		0.396
No	4(9.1) 40(90.9)		

There was not a statistically significant relationship between gender, profession, work experience, or on-the-job training on PEC and knowledge of identification of conjunctivitis.

Table 9 Relationship between PHCWScharacteristics and knowledge of identification of conjunctivitis. (N=91)

Characteristic	Knowledge of identification of conjunctivitis		
	Correct n(%)	Incorrect n(%)	p-value
Gender			
Female	32(69.6)	14(30.4)	0.752
Male	32(71.1)	13(28.9)	
Profession			
CO	16(84.2)	3(15.8)	0.503
Nurse	48(66.7)	24(33.3)	
Work experience (Years)			
<5	19(61.3)	12(38.7)	
6-10	23(76.7)	7(23.3)	
11-15	17(73.9)	6(26.1)	0.586
>15	5(71.4)	2(28.6)	
On-the-job training on PEC			
Yes	32(68.1)	15(31.9)	0.628
No	32(72.7)	12(27.3)	

There was a statistically significant relationship between work experience and the participants' knowledge of the identification of ophthalmia neonatorum (p= 0.014) but not on gender, profession, or on-the-job training on PEC and knowledge of identification of ophthalmia neonatorum.

Table10 Relationship between PHCWScharacteristics and knowledge of identification of ophthalmia neonatorum (N=91)

Characteristic	Knowledge ofidentification of ophthalmia neonatorum		
	Correct n(%)	Incorrect n(%)	p-value
Gender			
Female	31(67.4)	15(32.6)	0.767
Male	29(64.4)	16(35.6)	
Profession			
CO	13(68.4)	6(31.6)	0.657
Nurse	47(65.3)	25(34.7)	
Work experience (Years)			
<5	14(45.2)	17(54.8)	**0.014**
6-10	23(76.7)	7(23.3)	
11-15	19(82.6)	4(17.4)	
>15	4(57.1)	3(42.9)	
On-the-jobtraining on PEC			
Yes	32(68.1)	15(31.9)	0.655
No	28(63.6)	16(36.4)	

4.2.5 Practice of PHCWS on the management of common eye conditions

A total of 87(95.6%) and 80 (87.9%) participants had goodpractice in the management ofa cataractand presbyopia respectively while 87(95.6 %)participants had low practice in the managementof ophthalmia neonatorum.
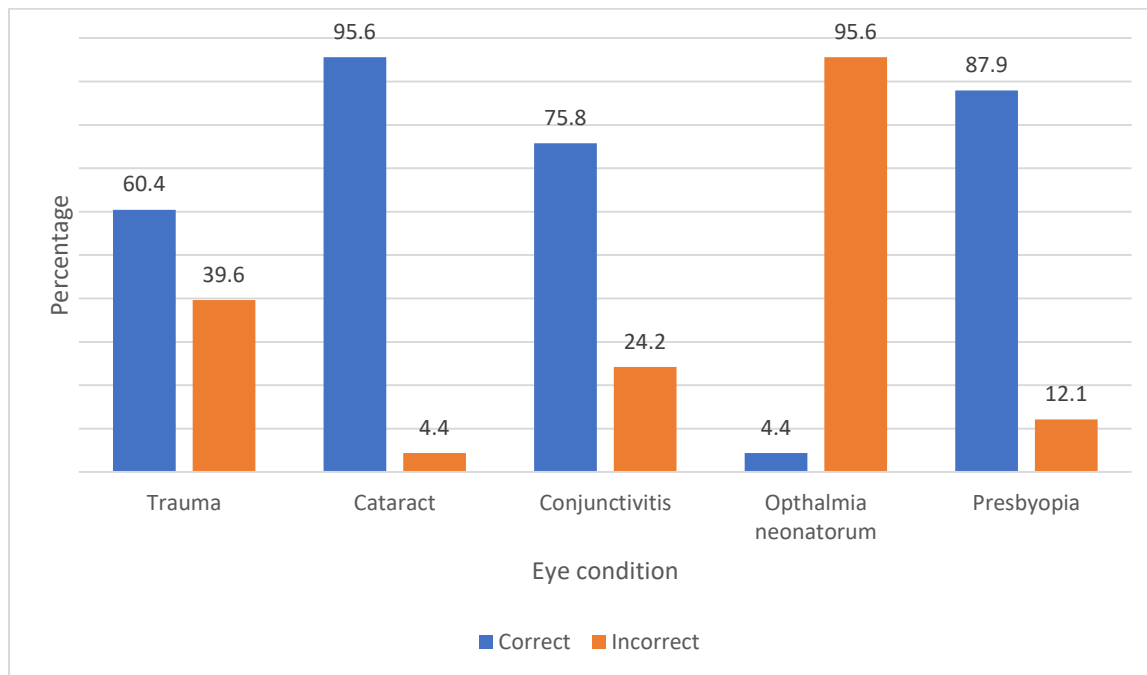
Figure 5Practice in the management of eye conditions (N=91)

4.2.6 Relationship between PHCWS characteristics and their practice in management of selected primary eye conditions.

There was not a statistically significant relationship between the respondent's characteristics and practice in management oftrauma.

Table 11Relationship between PHCWS characteristics and their practice in management of trauma. (N=91)

Characteristic	Practice in the management of trauma		
	Correct n(%) Incorrect n(%)		p-value
Gender			
Female	27(58.7) 19(41.3)		0.731
Male	28(62.2) 17(37.8)		
Profession			
CO	10(52.6) 9(47.4)		0.171
Nurse	45(62.5) 27(37.5)		
Work experience (Years)			
<5	16(51.6) 15(48.4)		0.154
6-10	16(53.3) 14(46.7)		
11-15	17(73.9) 6(26.1)		
>15	6(85.7) 1(14.3)		
On-the-jobtraining on PEC			
Yes	29(61.7) 18(38.3)		0.799
No	26(59.1) 18(40.9)		

There was not a statistically significant relationship between the PHCWS characteristics and their practice in the management of cataract.

Table 12 Relationship between PHCWS characteristics and their practice in the management of cataract. (N=91)

Characteristic	Practice in the management of cataract		
	Correct n(%) Incorrect n(%)		p-value
Gender			
Female	45(97.8)	1(2.2)	0.296
Male	42(93.3)	3(6.7)	
Profession			
CO	18(94.7)	1(5.7)	0.926
Nurse	69(95.8)	3(4.2)	
Work experience (Years)			
<5	28(90.3)	4(12.9)	0.318
6-10	29(96.7)	1(3.3)	
11-15	23(100.0)	0(0.0)	
>15	7(100.0)	0(0.0)	
On-the-jobtraining on PEC			
Yes	46(97.9)	1(2.1)	0.275
No	41(93.2)	3(6.8)	

There was not a statistically significant relationship between the respondent's gender, profession, years of experience as a PHCWS, or on-the-job training on PEC and their practice in the management of presbyopia.

Table 13 Relationship between PHCWS characteristics and their practice in the management of presbyopia. (N=91)

Characteristic	Practice in the management of prebyopia		
	Correct n(%) Incorrect n(%)		p-value
Gender			
Female	42(91.3) 4(8.7)		0.316
Male	38(84.4) 7(15.6)		
Profession			
CO	17(89.5) 2(10.5)		0.681
Nurse	63(87.5) 9(12.5)		
Work experience (Years)			
<5	27(87.1) 4(12.9)		
6-10	27(90.0) 3(10.0)		
11-15	19(82.6) 4(17.4)		0.634
>15	7(100.0) 0(0.0)		
On-the-jobtraining on PEC			
Yes	41(87.2) 6(12.8)		0.838
No	39(88.6) 5(11.4)		

There was not a statistically significant relationship between the PHCWS characteristics and their practice in the management of conjunctivitis

Table 14 Relationship between PHCWS characteristics and their practice in the management of conjunctivitis. (N=91)

Characteristic	Practice in the management of conjunctivitis		
	Correct n(%)	Incorrect n(%)	p-value
Gender			
Female	33(71.7)	13(28.3)	0.357
Male	36(80.0)	9(20.0)	
Profession			
CO	15(78.9)	4(21.1)	0.592
Nurse	54(75.0)	18(25.0)	
Work experience (Years)			
<5	25(80.6)	6(19.4)	
6-10	23(76.7)	7(23.3)	
11-15	17(73.9)	6(26.1)	0.619
>15	4(57.1)	3(42.9)	
On-the-jobtraining on PEC			
Yes	38(80.9)	9(19.1)	0.247
No	31(70.5)	13(29.5)	

There was not a statistically significant relationship between ophthalmia neonatorum and any of the PHCWS characteristics.

Table 15 Relationship between PHCWS characteristics and their practice in the management of ophthalmia neonatorum. (N=91)

Characteristic	Practice in the management of ophthalmia neonatorum		
	Correct n(%)	Incorrect n(%)	p-value
Gender			
Female	1(2.2)	45(97.8)	0.296
Male	3(6.7)	42(93.3)	
Profession			
CO	1(5.7)	18(94.7)	0.926
Nurse	3(4.2)	69(95.8)	
Work experience (Years)			
<5	3(9.7)	28(90.3)	0. 106
6-10	0(0.0)	30(100.0)	
11-15	0(0.0)	23(100.0)	
>15	1(14.3)	6(85.7)	
On-the-jobtraining on PEC			
Yes	1(2.1)	46(97.9)	0.275
No	3(6.8)	41(93.2)	

4.3Knowledge and practice of eye conditions presented in the mother/child booklet

4.3.1History of use of mother/child booklet

A total of 79(86.8%)participantsaffirmed that they had used the mother and child booklet while 71(78.0%) indicated that they were aware of the section about identification of early eye problems in infants.

Table 16Participants use of mother/child booklet (N=91)

Parameter	Response	No. of PHCWS	Percentage
Have you ever used the mother and child booklet	Yes	79	86.8
	No	12	13.2
Total		**91**	**100**
If YES, are you aware of the section about identification of early eye problems in infants?	Yes	71	78
	No	20	22
Total		**91**	**100**

4.3.2 Knowledge of identification of eye condition presented in the mother/child booklet

A total of 78(85.7 %,)participants correctly identified squint, while 56(61.5%) correctly identified white reflex.
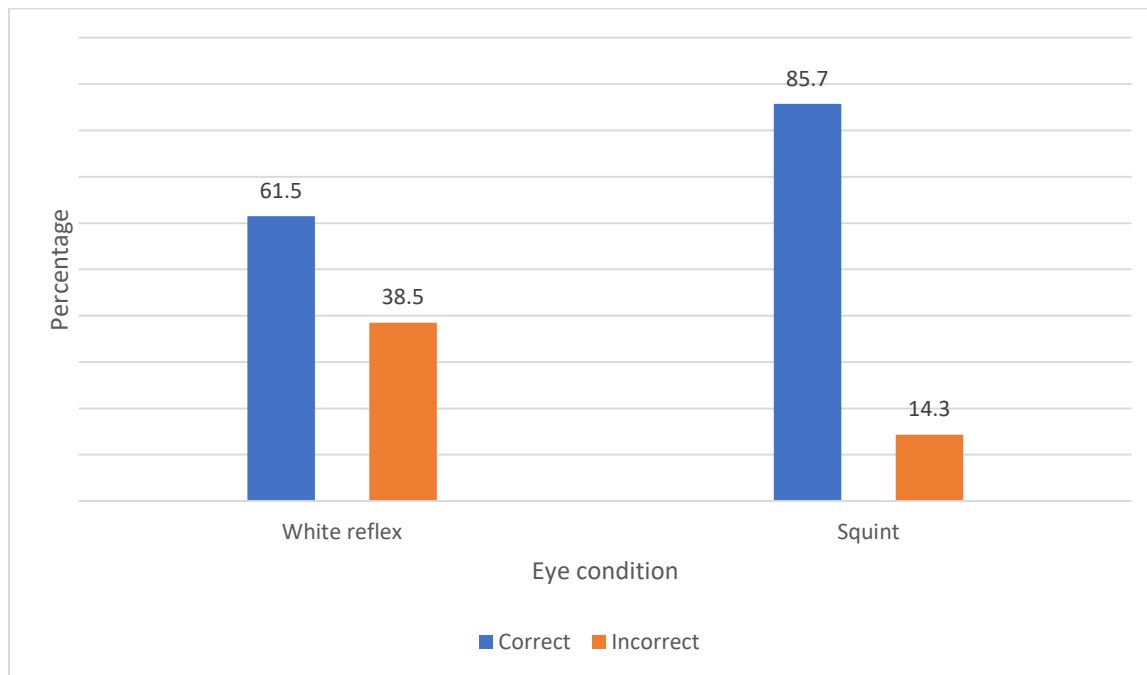

Figure 6Knowledge of identification of eye condition presented in the mother/child booklet (N=91)

Additionally, 84(92.3%) and 89(97.8%)participants affirmed that the two conditions, white reflex and squint, were abnormal respectively.

4.3.3 Practice in the management of eye condition presented in the mother/child booklet

Among the participants, 83(91.2%) and 70(76.9%) of them indicated that they would immediately refer children with white pupil reflexand squint.
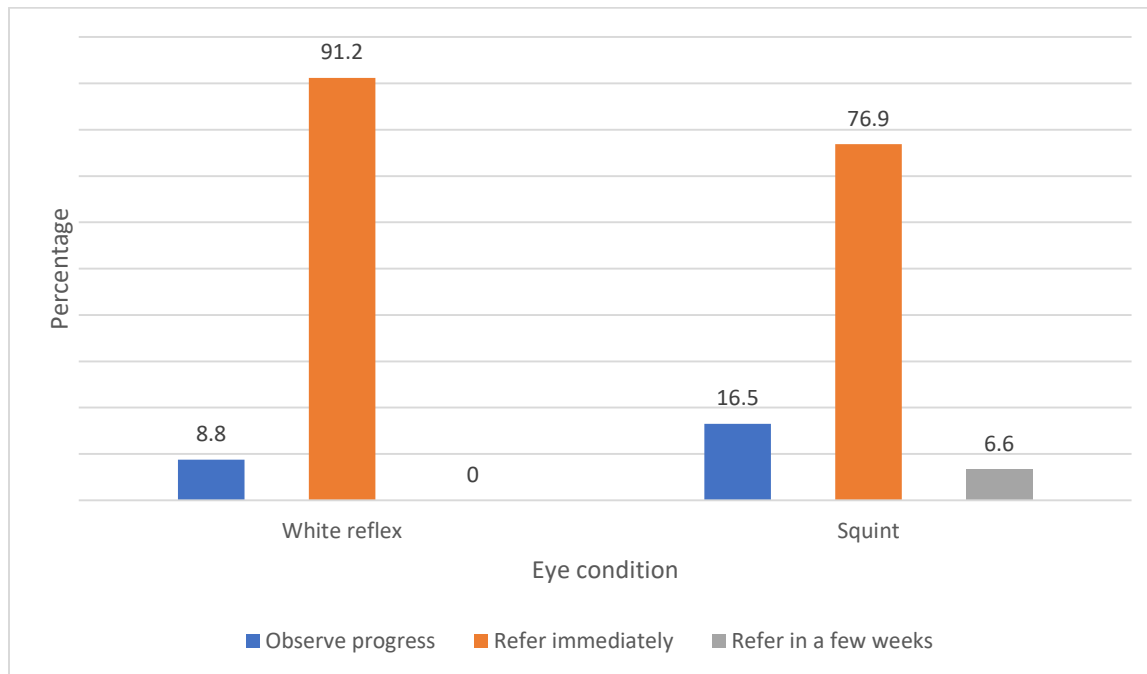

Figure 7Practice in the management of eye condition presented in the mother/child booklet (N=91)

4.3.4 Relationship between PHCWS characteristics and their knowledge ofthe description of white reflex and squint

There was no significant relationship betweenPHCWScharacteristics and the description of a white pupil reflex.

Table 17 Relationship between PHCWS characteristics and their knowledge ofthe description of white pupil reflex.(N=91)

Characteristic	Knowledge of description of white reflex		
	Correct n(%) Incorrect n(%)		p-value
Gender			
Female	28(60.9) 18(39.1)		0.895
Male	28(62.2) 17(37.8)		
Profession			
CO	13(68.4) 6(31.6)		0.969
Nurse	43(59.7) 29(40.3)		
Work experience (Years)			
<5	19(61.3) 12(38.7)		
6-10	21(70.0) 9(30.0)		
11-15	13(56.5) 10(43.5)		0.535
>15	3(42.9) 4(57.1)		
On-the-jobtraining on PEC			
Yes	32(68.1) 15(31.9)		0.185
No	24(54.5) 20(45.5)		

There was a significant difference between the description of squint and work experience of more than 5 years (0.024)

Table 18 Relationship between PHCWS characteristics and their knowledge ofthe description of squint (N=91)

31

Characteristic	Knowledge of description of squint		
	Correct n(%)	Incorrectn(%)	p-value
Gender			
Female	35(76.1)	11(23.9)	0.317
Male	38(84.4)	7(15.6)	
Profession			
CO	14(73.7)	5(26.3)	0.075
Nurse	59(81.9)	13(18.1)	
Work experience (Years)			
<5	23(74.2)	8(25.8)	
6-10	26(86.7)	4(13.3)	
11-15	21(91.3)	2(8.7)	**0.024**
>15	3(42.9)	4(57.1)	
On-the-jobtraining on PEC			
Yes	37(78.7)	10(21.3)	0.711
No	36(81.8)	8(18.2)	

4.3.5 Relationship between PHCWS characteristics and their practice in the management of white pupil reflex and squint

There was a significant relationship between the respondents'on-the-job training on PEC and their practice in the management of white reflex (P= 0.049) but not on the other characteristics.

Table 19 Relationship between PHCWS characteristics and their practice in the management of white reflex (N=91)

Characteristic	Practice in the management of white reflex		
	Correct n(%)	Incorrect n(%)	p-value
Gender			
Female	2(4.3)	44(95.7)	0.130
Male	6(13.3)	39(86.7)	
Profession			
CO	2(10.5)	17(89.5)	0.892
Nurse	6(8.3)	66(91.6)	
Work experience (Years)			
<5	4(12.9)	27(87.1)	
6-10	3(10.0)	27(90.0)	
11-15	1(4.3)	22(95.7)	0.583
>15	0(0.0)	7(100.0)	
On-the-jobtraining on PEC			
Yes	2(4.3)	45(95.7)	**0.049**
No	6(13.6)	38(86.4)	

There was a significant relationship between the respondent's on-the-job training on PEC and their practice in the management of squint (p= 0.001). However, there was not a statistically significant relationship between gender, profession, work experience, or on-the-job training on PEC

Table 20 Relationship between PHCWS characteristics and their practice in the management of squint (N=91)

Characteristic	Practice in the management of squint		
	Correctn(%) Incorrectn(%)		p-value
Gender			
Female	6(13.0)	40(87.0)	0.664
Male	9(20.0)	36(80.0)	
Profession			
CO	3(15.8)	16(84.2)	0.804
Nurse	12(16.7)	60(83.3)	
Work experience (Years)			
<5	4(12.9)	27(87.1)	
6-10	5(16.7)	25(83.3)	
11-15	4(17.4)	19(82.6)	0.395
>15	2(28.6)	5(71.4)	
On-the-job training on PEC			
Yes	2(4.3)	45(95.7)	**0.001**
No	13(29.5)	31(70.5)	

CHAPTER FIVE: DISCUSSION

5.1 Characteristics of Participants

The mean age of the PHCWS was 34.68 years which was similar to the study done by Burn et alin Nepal (35 years) showing the two studies had a similar age distribution.[19] Female and male participants were almost equal at 50.5% and 49.5% respectively.

More than half of PHCWS had a work experience of less than 10 years (61%). A larger proportion of the participants (82.4%) affirmed that they were trained on PEC in the curriculum with all clinical officers reporting being trained. This is higher than the study done in Nepal by Burn et al (8.4%) and Tanzania (41%) by Byamukama et al.[19, 24]However, Gichangi et al found that 97% of the PHCWS in Kenya had received PEC training.[22]

A total of 51.6% of the PHCWS had attended an on-the-job training on PEC with nurses having a slightly larger proportion (54.3%) than clinician officers (42.9 %).

5.1.1Knowledge of the Primary Eye Care

Knowledge of the assessment of visual acuity was low (34.1 %). This was however higher than what Burn et al in Nepal (14%), Amanitu et al in Nigeria (12.5%), and Gichangi et al in Kenya (8.2%) found.[19,23,22]The majority of the participants indicated that a visual acuity chart was not available. There was a significant relationship (p= 0.038) between the availability of a visual acuity chart in the facility and the primary healthcare workers' knowledge on how to measure vision. This could be because the availability of the chart at the facility might prompt the health care workers to reassess their skill on how to use the chart hence the acquisition of the knowledge in measuring visual acuity. In addition, knowledge of measuring visual acuity was associated with on-the-job training on PEC (p= 0.008). This finding is in line withthat of Burn et al who found that lack of on-the-job training was associated with knowledge deficits in measuring visual acuity.[19]

The majority of the PCHW were able to identify most of the eye conditions presented to them through images and short history. Eye trauma and cataract were the most identified at 90.1% each, this being higher than what Burn et al found for cataract (75.7%) but similar to what Gichangi et al found among the Kenyan participants for trauma (91%).[19,22] Conjunctivitis was rightly identified by 70.3% of the PHCWS and this was almost similar to what Byamukama et al found (67.3%) but

lower than what was reported by Burn et al (83.2%).[24,19]A total of 65.9% PHCWS identified ophthalmia neonatorum which was more than what was reported by Burn et al (54.2%).[19] This increase in correct responses in the above cases could be associated with the increase in the PHCWS trained on PEC in their curriculum. Despite this, presbyopia was poorly identified at 12.1% compared to other studies like Gichangi et al which got a correct response of 30% among Kenyan participants. [22] There was a statistically significant relationship between work experience and the participant'sknowledge of the identification of ophthalmia neonatorum (p= 0.014). However, there was not a statistically significant relationship between gender, profession, work experience,or on-the-jobtraining on PEC and knowledge of the identification of other selected primary eye conditions.

5.1.2Practice in the management of PEC conditions

Most of the PHCWSinterviewed (60.4%) would refer a trauma patient for further management. This is comparable to what Amanitu et al found in Nigeria (62.5%).[23] For cataract, a large portion (95.6%) of the participants would refer a cataract patient for surgery this being a higher number than what Byamukama et al found in Tanzania (69.2%).[24] This could probably be associated with the many outreaches for eye care happening in the various parts of the county enabling most PHCWSto know that cataract is treatable by surgery. Most(75.8%) of the respondents would treat conjunctivitis with antibiotic drops/ointment this being higher than what Amanitu et al and Byamukama et al found in their studies (50% and 67.3% respectively) and this could also be attributed to more PHCWS having being trained on PEC in curriculum. [23,24] Despite a few PHCWSidentifying presbyopia, most (87.9%) were aware that it is treated with spectacles, the proportion being higher than that seen in a study by Byamukama et al (67.3%).[24]On the other hand, despite most PHCWS being able to identify ophthalmia neonatorum, their practice in the management was poor as only 4.4% of them knew the correct management. This is quite different from what Burn et al got from Nepal where 52.3% of the PHCWS would treat and refer ophthalmia neonatorum patients for further management.[19]

There was not a significant differencebetween the respondents' gender, profession, years of experience,and on-the-jobtraining on PEC and their practice in the management of the eye conditions presented in the questionnaire.

5.1.3 Knowledge and practice in the early eye problems as found in the MCH booklet

The mother and child booklet contains a section on the identification of early eye problems with two conditions presented including white reflex and squint. A larger portion of the PHCWSs affirmed that they had used the mother and child booklet (86.8%) and that they were aware of the section about the identification of early eye problems in infants (78%). A majority of the PHCWSs were knowledgeable that squint and white pupil reflex were abnormal conditions (92.3% and 97.8% respectively). However, while a larger portion of the participants correctly identified squint (87.5%), onlyslightly more than half of the participants correctly identified white reflex. Additionally, a majority of the participants indicated that they would immediately refer children with a white reflex (91.2%) and squint (76.9%) which is the correct management for the two eye conditions in a primary health care setting.The better identification and less referral of squint compared to white pupil reflex could be due to the many uncorrected squints in the society hence most people assume it is either normal or can't be treated. There was a statistically significant relationship between work experience and the participant'sknowledge of theidentification of squint (p= 0.024). Practice in the management of white reflex and squint was significantly associated with on-the-job training on PEC (p= 0.049 and p= 0.001 respectively). This finding, together with the findings on the impact of the availability of a visual acuity chart at the facility indicated that access to training and necessary resources at the facility had a positive impact on knowledge of the various aspects of PEC.

5.2Conclusion

1. PHCWS in Bungoma County displayed good Knowledge of theidentification of eye trauma, cataract, conjunctivitis, and ophthalmia neonatorum but noton presbyopia.Knowledge of measuring visual acuity was low but significantly associated with the availability of a visual acuity chart and training on PEC both in the curriculum and on the job.

2. Practice in themanagementof eye conditions was good forwhite reflex, squint, cataract, conjunctivitis, trauma to the eye,and presbyopia but poor forophthalmia neonatorum. There was a significant association between on-the-job training and the practice of management of white reflex and squint.

5.3 Recommendation

Based on the findings of our study, we can recommend that:

    i.   The health facilities management to ensure the availability of visual acuity charts at the facilities.

   ii.   PHCWSs empowerment through awareness creation:

- ✓ The PHCWSs take self-initiative and seek information on various aspects of PEC including measuring of visual acuity, identification of eye conditions, and their management.
- ✓ County Ministry of Health and hospital management to organize on-the-job training on various aspects of PEC for PHCWSs across the health facilities.

5.4 Limitations

The findings may not be generalized as the knowledge and practice of PEC among PHCWSs in Kenya, therefore, it is suggested that more studies be conducted across all the counties before generalization of the findings.

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APPENDICES

Appendix I: Work Plan

YEAR/MONTH ACTIVITY	Aug. 2022	Sept.-Jan. 2022	Feb- Mar. 2023	Apr. 2023	May 2023
Problem identification/concept writing	███				
Proposal development and approval		███			
Data collection			███		
Data analysis/report writing				███	
Report project defense					███

Appendix II: Study Budget

Item	Unit cost	Quantity	Cost	Total cost
Human resource/data collection				
Training of research assistants	1000	2x2x1,000	4,000	
Research assistants' lunch and transport (2 assistants)	1500	2x10x1500	30,000	
Principal investigator researcher (1)	1500	1x10x1500	15,000	
Sub-total				49,000
Materials and supplies				
Biro pens (1 dozen)	300	300x1	300	
Pencils (1 dozen)	300	300x1	300	
Rubbers (3)	30	30x3	90	
Folders (3)	300	300x3	900	
Field books	100	100x3	300	
Stapler and staples	1000	1000	1000	
Sub-total				2890
Proposal				
Proposal printing (50 pgs.)	10	50x10	500	
Proposal photocopying	5	5x50x3	750	
Computer services	5000		5000	
Binding	200	200x3	600	
Sub-total				6850
Checklist and consent forms printing	10	5x20x10	1000	
Checklist and consent forms photocopying	5	5x5x20	500	
Computer services	2000		2000	
Sub-total				3500
REPORT				
Report printing	10	75x5x10	3750	
Photocopying final report (5 copies)	5	75x5x5	1875	
Computer services			2000	
Binding	200	200x5	1000	
KNH/UON ERC fee	500	500x1	500	
Subtotal				9125
Total				71365
Contingency				7136.50
Grand TOTAL				78 501.50

Appendix III: Informed consent form

Introduction

My name is Dr. Patrick Gathitu, a student at the University of Nairobi pursuing a master's degree in Ophthalmology. I am undertaking a research study on the knowledge and practice of primary eye care among primary healthcare workers in Bungoma County.

The purpose of this information is to give you details about the study that will enable you to make an informed decision regarding participation. You are free to ask questions to clarify any of the aspects we will discuss in this information and consent form. I will also ask you questions regarding the study before you sign the consent form to ascertain your comprehension of the information provided.

Also, the study proposal will be reviewed by the University of Nairobi- Kenyatta National Hospital Ethics and Research Committee to assess formally if the research is ethical, that is, if it conforms to the recognized ethical standards which include respecting dignity, safety, rights, and well-being of the participants.

Purpose of the study

Background and objective: The purpose of this study is to determine the knowledge and practice of primary eye care among primary healthcare workers in Bungoma County.   The findings from this study could be used to guide programs towards improved primary eye care service provision to patients in the communities across Bungoma County.

Participation

Participation in the study will entail answering questions on the questionnaire. You will not be subjected to any invasive procedure.

Description of the study

I am kindly requesting that you participate in this study by answering the questions to the best of your knowledge and understanding. If you choose to participate the researcher will then request you to give responses to a series of questions based on the research objectives.

Confidentiality

All the information that will be given in the form of responses, opinions, and views during this study, will be treated with confidentiality and there will be no penalty to any respondent for withdrawing their participation in this study. All the information collected from this study will only be used for research purposes. Any details that may lead to your identification like your name will not appear anywhere in this study to maintain anonymity as this study will only utilize the statistics collected for voluntary participation.

Voluntary participation

Your participation in this study is voluntary. Kindly answer the questions as honestly as possible. There are no penalties in a case where the respondent feels not obliged to answer or feels to withdraw from the study at any stage.

Benefits

This research work is for academic purposes only and there shall be no monetary benefits involved. The study findings will be made available at the University of Nairobi, various primary health facilities across the county, and the county department of health office.

Potential risks

There are neither risks nor harm anticipated in this study. No invasive procedures will be employed in this study.

Compensation: There is no compensation for participating in the study.

Conflict of interest: The researcher and the supervisor confirm that there is no conflict of interest among them.

Contacts

For any questions and clarifications about this study, kindly contact;

Investigator:Patrick Gathitu

Email: gathitup@gmail.com   Phone number: 0726162123

Supervisors:

Dr Margaret Njuguna,

MBChB, M.Med (Ophthalmology) (Nrb), ICO, FEACO

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Consultant Ophthalmologist/Glaucoma Specialist

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The Secretary,
University of Nairobi- Kenyatta National Hospital Ethics and Research Committee
P.O BOX 19676 Code 00202
Tel: (254-020)-2726300 Ext 44355
Email: uonknherc@uonbi.ac.ke   Website: http://www.facebook.com/uonknh.erc

Appendix IV: Informed Consent Certificate

If you consent to participate in the study, please sign below:

I hereby consent to participate in this study. I have been informed of the nature of the study being undertaken and the potential risks explained to me. I also understand that my participation in the study is voluntary.

Participants Signature ……………………Date…………………

I confirm that I have clearly explained to the participant the nature of the study and the contents of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator Signature……………………………Date.…………………………….... Investigator

For any questions and clarifications about this study, kindly contact;

Investigator:Patrick Gathitu

Email: gathitup@students.uonbi.ac.ke   Phone number: 0726162123

Supervisors:

Dr Margaret Njuguna,

MBChB, M.Med (Ophthalmology) (Nrb), ICO, FEACO

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Consultant Ophthalmologist/Glaucoma Specialist

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Appendix V: Questionnaire

Questionnaire serial number _____

Instructions

Please answer the questions as honestly as possible.

Section A: Demographic information

Date…………………   Facility name……………………

1. Age _____

Sex   Male [   ] b) Female [   ]

Profession?   Clinical Officer [   ]   b) Nurse [   ]

Years of work as a health care worker _____

Were you trained in eye care in your curriculum?

       Yes [   ]   b) No [   ]   c) cannot remember [

Have you ever attended on-the-job training on primary eye care?

Yes [   ] b) No [   ]

Section B: Knowledge and practice in the primary eye care

Is there a visual acuity chart in your facility a) Yes [   ] b) No [   ] c) Don't know [   ]

Briefly describe how you measure visual acuity in an adult patient

_____

_____

3. Below are images and a brief history of various patients, identify the problem and state how you would manage them

Image 1

A patient assaulted while going home at night by persons not known to them

    Identify the problem _____

Management

_____

_____

Image 2

A 60year old patient with history of diminishing vision over the last 1 year, no pain, no history of trauma

Identify the problem_____

Management

_____

Image 3

A 55year old teacher not able to mark scripts, thread a needle or see small letters

Identify the problem _____

Management

_____

Image 4

A 14-year-old patient with 2-day history of left eye redness, sticky discharge but vision acuity is normal

Identify the problem _____

Management

_____

Image 5

A two-day old neonate with whitish eye discharge

Identify   the   problem

_____

Management

_____

6. Below is an image of MCH booklet
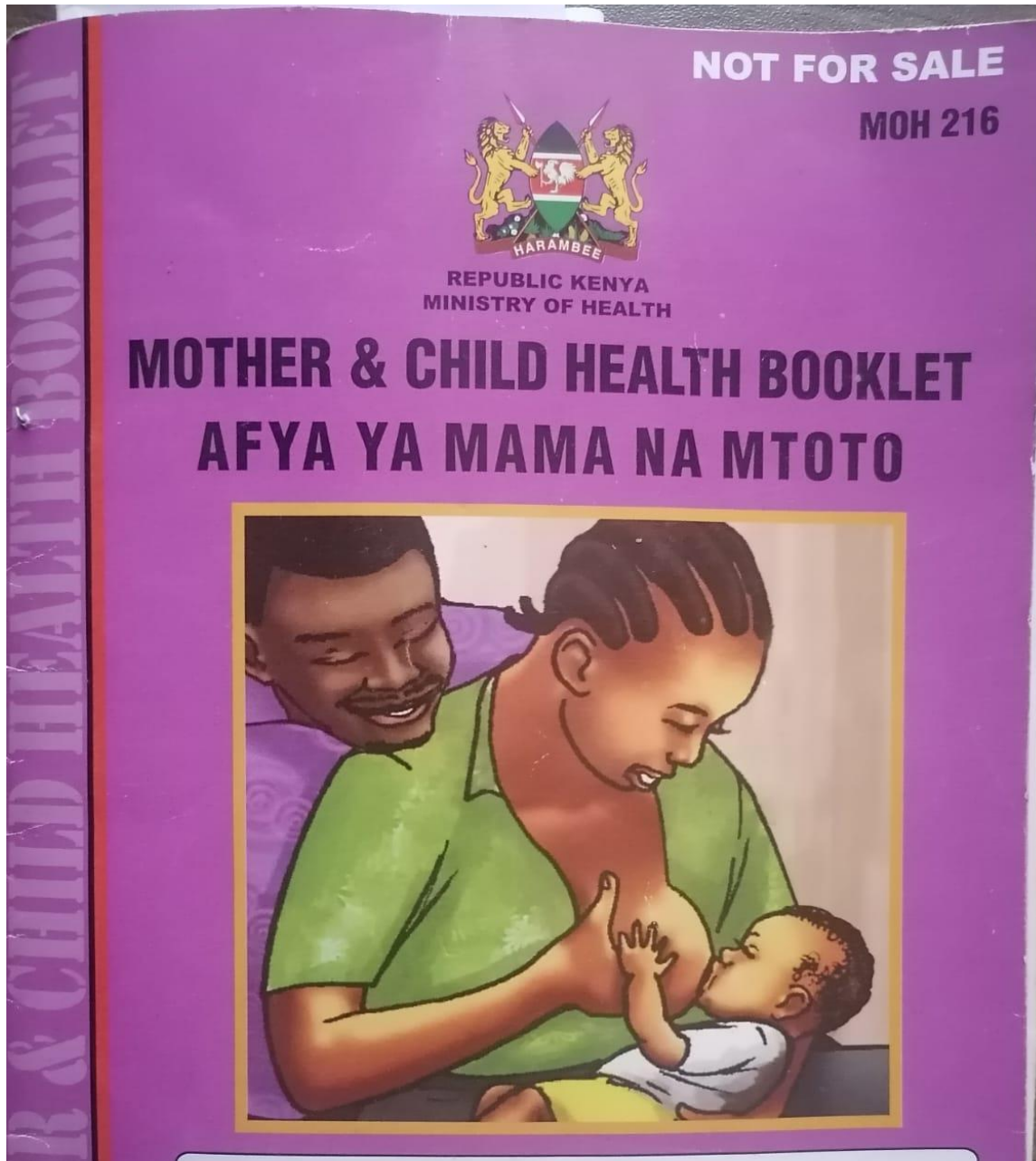
Have you ever used it to manage a child? Yes [ ] No [ ]

If yes, are you aware of the section about identification of early eye problems in infants?   Yes [ ] No [ ]

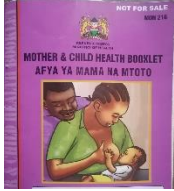The images below are similar to those in MCH booklet, please answer the questions asked

Image A

Describe what you see in LE_____?

Is it normal_____?

What will you do? a) Observe progress [ ]   b) Refer immediately [ ]   c) Refer in a few weeks [ ]

Image B
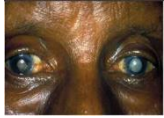
Describe what you see in RE_____?

Is it normal_____?

What will you do? a) Observe progress [ ]   b) Refer immediately [ ] c) Refer after weeks [ ]

-ENDS-

Table of expected right answers

Condition	History	Identify	Management
	A patient with history of assault	Eye trauma/injury	Refer
	A patient with progressive visual loss	Cataract	Refer for surgery
	A patient not able to do near work	Presbyopia	Spectacles
	Two day history of redness and sticky discharge	Conjunctivitis Red eye	Antibiotics drops/ointment
	Have you ever used MCH booklet Are you aware of infant eye problems in the booklet	Yes/No Yes/No	
	Two day old with whitish eye discharge	Ophthalmia neonatorum/neonatal conjunctivitis	Treat with antibiotic drop/ointment and refer
	Describe LE	White reflex	Refer immediately
	Describe LE	Squint	Refer immediately