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Evaluation of Impact of Ophthalmology Rotation on Family Medicine Practice in Northern Nigeria: A Multicenter Study

Évaluation de l'Impact de la Rotation en Ophtalmologie sur la Pratique de la Médecine Familiale dans le Nord du Nigeria : Une Étude Multicentrique

¹F. J. Oyediji, ²R. J. Alfin, ³N. G. Bupwatda

ABSTRACT

BACKGROUND: Globally, 36 million people are blind and 217 million people have moderate or severe distance vision impairment. Eighty-nine percent of vision impaired people live in low and middle-income countries. To prevent progression to blindness, there is need for early diagnosis and referral for treatment. At the heart of this are the Family Physicians who are the first port of call for our teeming population.

OBJECTIVE: The main aim of this study is to assess the ophthalmic knowledge base of Family Physicians and level of utilization of skills acquired during the ophthalmology rotation in their day-to-day practice.

METHODS: A cross-sectional descriptive survey was conducted. A self-administered questionnaire was filled by all consenting Family Physicians in 4 hospitals in 2 states. It included self-assessment section on knowledge, ophthalmic skills and open-ended questions on suggestions. On the spot assessment of available ophthalmic equipment was made.

RESULTS: A response rate of 57.9% was obtained. Respondents are graduates from 14 states across the country; mostly in Northern Nigeria 61 (87.1%) and 65.6% from University of Jos. There was no statistically significant difference between the level of practice and comfort in managing ophthalmic conditions ($p = 0.949$). Respondents made suggestions on training, duration and equipment.

CONCLUSION: Despite good rating in managing ophthalmic conditions, only one of the 4 hospitals had ophthalmic equipment. There is a need to objectively measure Family Physicians' ophthalmic skills to ensure that eye patients seen first by Family Physicians receive appropriate treatment. **WAJM 2023; 40(1): 60–66.**

Keywords: Ophthalmology, Family Medicine, training, Nigeria.

RÉSUMÉ

CONTEXTE: Dans le monde, 36 millions de personnes sont aveugles et 217 millions de personnes souffrent d'une déficience modérée ou grave de la vision de loin. Quatre-vingt-neuf pour cent des personnes atteintes de déficience visuelle vivent dans des pays à revenu faible ou moyen. Pour prévenir la progression vers la cécité, il est nécessaire de poser un diagnostic précoce et d'orienter les patients vers un traitement. Les médecins de famille sont au cœur de cette démarche, car ils sont les premiers à s'occuper de cette population foisonnante.

OBJECTIFS: L'objectif principal de cette étude est d'évaluer la base de connaissances ophtalmologiques des médecins de famille et le niveau d'utilisation des compétences acquises pendant la rotation en ophtalmologie dans leur pratique quotidienne.

MÉTHODES: Une enquête descriptive transversale a été menée. Un questionnaire auto-administré a été rempli par tous les médecins de famille consentants dans 4 hôpitaux de 2 états. Il comprenait une section d'auto-évaluation des connaissances, des compétences ophtalmiques et des questions ouvertes sur les suggestions. Une évaluation sur place de l'équipement ophtalmique disponible a été effectuée.

RÉSULTATS: Un taux de réponse de 57,9% a été obtenu. Les répondants sont des diplômés de 14 États du pays, principalement du nord du Nigeria (61, 87,1%) et 65,6% de l'Université de Jos. Il n'y avait pas de différence statistiquement significative entre le niveau de pratique et de confort dans la gestion des conditions ophtalmiques ($p = 0,949$). Les répondants ont fait des suggestions sur la formation, la durée et l'équipement.

CONCLUSION: Malgré une bonne évaluation dans la prise en charge des conditions ophtalmiques, seul un des 4 hôpitaux disposait d'un équipement ophtalmique. Il est nécessaire de mesurer objectivement les compétences ophtalmiques des médecins de famille afin de s'assurer que les patients oculaires vus en premier par les médecins de famille reçoivent un traitement approprié. **WAJM 2023; 40(1): 60–66.**

Mots clés: Ophtalmologie, Médecine de famille, formation, Nigeria.

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INTRODUCTION

Historically, primary healthcare can be traced back to about 1920, when the Dawson Report was released in the United Kingdom and “primary health care centres,” was mentioned.¹ Reports from the Institute of Medicine (IOM) defined primary care as “the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.”²

The World Health Organization (WHO) in 1978 and World Organization of Family Doctors (WONCA) in 1991, both agreed on primary care definition which forms the basis for the four main features of primary care services: first-contact access for each new need; long-term person- (not disease) focused care; comprehensive care for most health needs; and coordinated care when it must be sought elsewhere.¹

One of the goals of the WHO health system framework is improved health both in level and equity. If this is based on specialist care only, it would take a long time to achieve, hence the need for primary health care (PHC).³

Central to deliver this equitable, high-quality PHC closer to the community are Family Physicians (FP) with postgraduate training where they attain knowledge and skills in the various medical disciplines. One of these key disciplines the FP trainee encounters is ophthalmology. A good number of patients with ocular conditions are seen in primary care practice.^{4,5}

In 2020, a global estimate of 43 million were blind and 596 million had distance vision impairment, this was an increase from 2017 estimates of 39 million and 217 million respectively. Ninety percent of vision impaired people live in low and middle-income countries. Approximately 90% of the world’s vision impairment (VI) is considered avoidable.⁶ The implication is that early detection with appropriate referral from the Family Physicians (FP) to the ophthalmologist would decrease VI in Nigeria with attendant improved economy.⁷

In view of the pivotal role played by the multi-competent Family Physicians in providing comprehensive and good healthcare, this evaluation is necessary as survey results could be used to inform changes in ophthalmology rotation of Family Physicians, ultimately improving quality of primary eye care and referral pathway for more complex eye conditions. Therefore, this study is aimed to explore the ophthalmic knowledge base of Family Physicians and level of utilization of skills acquired during the ophthalmology rotation in their day-to-day practice. The objectives of the study were: To assess the adequacy of undergraduate and postgraduate ophthalmology exposure; determine proportion of Family Medicine consultations that is ophthalmology related; determine proportion of Family Physicians who are comfortable with managing common eye problems and their level of comfort with self-reported competence in performing basic ophthalmic skills as well as assess basic ophthalmology equipment in the Family Medicine Department.

SUBJECTS, MATERIALS AND METHODS

This is a descriptive cross sectional multicenter hospital-based survey conducted in four Family Medicine training centers’ General Outpatient Departments (GOPD) – Abubakar Tafawa Balewa University Teaching hospital, Bauchi; Bingham University Teaching Hospital Jos; Plateau State Specialist Hospital, Jos and Jos University Teaching Hospital Jos. They are accredited by the West African College of Physicians (WACP) and National Postgraduate Medical College of Nigeria (NPMCN) for training of Family Physicians. The choice of the four centers is based on the location of the authors at the time of the study. The research was carried out from July to September 2020. Ethical approval for this study was obtained from the Health Research Ethics Committees of the hospitals (ATBUTH(REC)No:0043/2019, JUTH/DCS/IREC/127/XXXI/2166, NHREC/05/01/2010b, NHREC/21/05/2005/00699) and informed consent obtained from each respondent.

The study population was made up of all doctors currently undergoing Family Medicine residency in the 4 hospitals and consultants who have completed their Family Medicine training. All consenting Family Physicians in training and consultants were enrolled while those who participated in the pretest survey were excluded from the final survey.

Authors had permission of the departmental heads who gave a list of all doctors and their current location within or outside the hospital was obtained. The investigators had an on-the-spot assessment of ophthalmic diagnostic equipment available. The physicians were approached at their free time and given the information sheet to read through. On accepting to partake in the survey, informed written consent was obtained, respondents kept a copy of the consent form before filling the self-administered questionnaire.

Data was analyzed using STATA 13 with descriptive and analytical statistics to yield frequencies, percentages and proportions. A significant between-class difference was indicated by $P < 0.05$.

The participants’ self-assessment of adequacy of their undergraduate/post graduate exposure to the core exposure areas was structured on a six-point Likert scale (0 – no exposure; 5 – excellent). Binary (Yes/No) responses were obtained on their self-rated competence in performance of core clinical skills and self-rated proficiency in the diagnosis of core clinical conditions. Likert scale-based responses were subsequently dichotomized and reduced to proportions by categorizing scores 0–2 as unsatisfactory or inadequate and 3–5 as satisfactory or adequate.

A mix of closed and open-ended questions were on the questionnaire; it was dominantly quantitative. Qualitative data was important in the study of complex interactions underlying ophthalmic training. The questions and possible responses underwent an iterative process of refinement, through the participation of Family Medicine trainees in Our Lady Apostles Hospital, Jos. The quantitative data was presented as descriptive statistics and qualitative analysis responses were collated from open question responses, and analysed thematically using manual coding.

RESULTS

Of the 121 Family Physicians, 70 responded to the questionnaire (response rate = 57.9%). Responses were received from all training institutions in Plateau and Bauchi States detailed in Table 1. Most physicians had their undergraduate training in Northern Nigeria 61(87.1%) with 46(65.6%) from University of Jos. The mean age of respondents was 39.9 years (range 27–59) and 46(65.7%) were male detailed on Table 1.

Ophthalmology posting duration varied. Overall, majority 59(84.3%) had 4 weeks of rotation in ophthalmology both at undergraduate and post graduate levels. Only 9(12.9%) junior residents were yet to go for ophthalmology posting as illustrated on Figure 1.

Subjective self-reported proportion of ophthalmology related consultations ranged from 1 to >20% displayed on Table 2 based on physicians’ level and hospital of practice.

On dichotomized Likert scale, 68(97.1%) rated their ophthalmology posting/training experience scale as satisfactory or adequate, only 2(2.9%) rated unsatisfactory. Half 37(52.9%) of those with adequate training ranked their exposure as average.

Half 36(51.4%) of the respondents felt moderately comfortable in managing ophthalmology associated issues. On dichotomized scale, most 60(85.7%) could comfortably manage ophthalmology related issues as shown in Table 3. Respondents rated themselves high for proficiency in performance of ophthalmic skills especially visual acuity, pupil examination and ophthalmic history taking. Table 4 shows their reported competence with clinical conditions. There was significant difference in the odds of competence between those who were comfortable and the no-comfortable groups for cornea, neuro-ophthalmology, retinopathies and clinical assessment.

Figure 2 shows the doctors’ adequacy of knowledge to diagnose ophthalmic conditions while Figure 3 shows those who could satisfactorily refer, make prescription, investigate and correlate systemic disease and the eye.

Table 1: Demographic Data

Characteristics of Family Physicians	Hospitals of Practice				Total N=121 N(%)
	ATBUTH (n=20) N(%)	BHUTH (n=16) N(%)	JUTH (n=66) N(%)	PSSH (n=19) N(%)	
Respondents	15(75)	14(87.5)	27(40.9)	14(73.7)	70 (57.9)
Current Level					
Junior resident	3(20.0)	4(28.6)	14(51.9)	3(21.4)	24 (34.3)
Senior resident	10(66.7)	4(28.6)	6(22.2)	7(50.0)	27(38.6)
Consultants	2(13.3)	6(42.8)	7(25.9)	4(28.6)	19 (27.1)
Age					
<30	0	0	7	0	7 (10.0)
31–40	9	6	14	7	36 (51.4)
>40	6	8	6	7	27 (38.6)
Sex					
Male	14(93.3)	8(57.1)	14(51.9)	10(71.4)	46 (65.7)
Female	1(6.7)	6(42.9)	13(48.1)	4(28.6)	24(34.3)

ATBUTH, Abubakar Tafawa Balewa University Teaching hospital; BHUTH, Bingham University Teaching Hospital; JUTH, Jos University Teaching Hospital; PSSH, Plateau State Specialist Hospital.

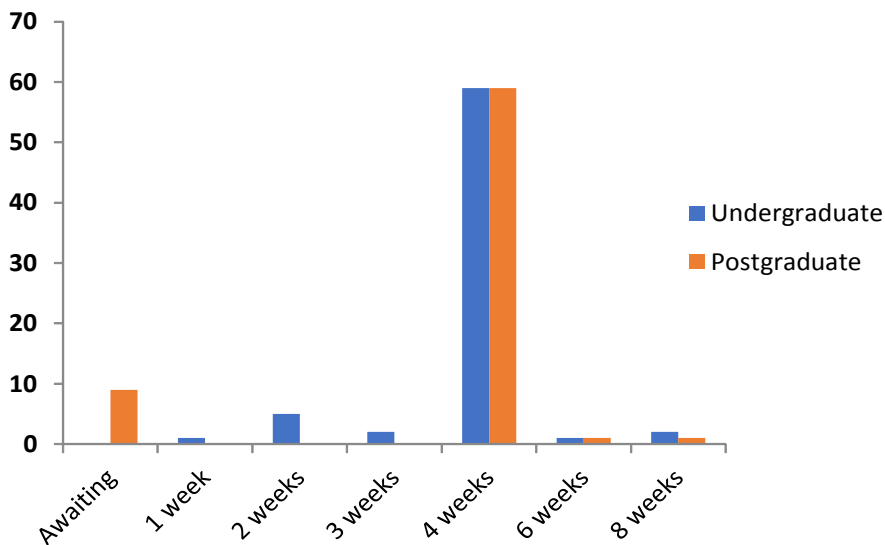


Fig. 1: Duration of Ophthalmology Posting

Thematic Analysis of the Qualitative Responses

Suggestions ranged from non by 17 respondents and 1–4 suggestions by the other 53. The main themes bordered on:

1. Duration of posting: 25 (47.2%) respondents suggested increasing posting to a minimum of 2 months both at undergraduate and post graduate levels, a diploma certificate, retraining through inter-departmental presentation.

“Diploma in ophthalmology should be added as a subspecialty training by the colleges NPMCN and WACS”.

“The posting duration is too small to learn much for the program”.

2. Task oriented training: 24(45.3%) suggested training in high volume centers, through tutorials/presentations, ensuring that activities are tailored to curriculum and curriculum should also be

Table 2: Distribution Family Medicine Consultations that are Ophthalmology Related by Level And Place of Practice

Characteristics of Family Physicians	Proportion of Ophthalmology Related Consultations					Total N (%)
	1-5% N (%)	>5-10% N (%)	>10-15% N (%)	>15-20% N (%)	>20% N (%)	
Current Level of Practice						
Junior residents	4(16.7)	5(20.8)	2(8.3)	7(29.2)	6(25)	24(34.3)
Senior residents	8(29.6)	7(25.9)	1(3.7)	3(11.2)	8(29.6)	27(38.5)
Consultants	7(36.8)	3(15.8)	2(10.5)	2(10.5)	5(26.4)	19(27.2)
Total	19(27.2)	15(21.4)	5(7.1)	12(17.1)	19(27.2)	70(100)
Place of Practice						
ATBUTH	8(53.3)	4(26.7)	0(0)	2(13.3)	1(6.7)	15(21.4)
BHUTH	4(28.6)	3(21.4)	1(7.2)	3(21.4)	3(21.4)	14(20)
JUTH	3(11.2)	5(18.5)	4(14.8)	6(22.2)	9(33.3)	27(38.6)
PSSH	4(28.6)	3(21.4)	0(0)	1(7.2)	6(42.8)	14(20)
Total	19(27.2)	15(21.4)	5(7.1)	12(17.1)	19(27.2)	70(100)

Table 3: FP Comfort Levels to Manage Eye Conditions

Current Level of Practice	Comfort Level of Family Physician			χ^2	P value
	No = Not Comfortable	Yes = Comfortable	Total		
Junior residents	3	21	24	0.104	0.949
Senior residents	4	23	27		
Consultants	3	16	19		
Total	10	60	70		

Table 4: Simple Logistic Regression of each Clinical Condition by Competence

Eye Condition	Comfort Level of Family Physicians		
	Odds Ratio	95% Confidence Interval	P value
Orbit and Lid	1.063	0.652 – 1.733	0.454
Conjunctiva/Sclera	1.029	0.579 – 1.828	0.525
Cornea	2.119	1.313 – 3.420	0.002
Neuro-Ophthalmology	2.212	1.373 – 3.563	0.010
Uveal tract	1.382	0.606 – 3.151	0.287
Paediatric Ophthalmology	1.702	0.860 – 3.368	0.088
Cataract	1.078	0.337 – 3.452	0.571
Retinopathies	2.732	1.499 – 4.980	0.010
Glaucoma	1.074	0.473 – 2.439	0.514
Systemic disease	1.149	0.742 – 1.780	0.304
Ocular emergencies	0.925	0.542 – 1.577	0.442
Medications	0.701	0.396 – 1.243	0.143
Clinical assessment	1.509	1.040 – 2.190	0.020
Investigations	0.963	0.520 – 1.783	0.513
Referrals	1.020	0.981 – 1.060	0.729

reviewed in line with current realities.

“Residents need high volume centers for maximum exposure which could be supported by

virtual pictures for personal review in line with covid-19 pandemic”.

3. More hands-on: 16(30.2%) suggested that trainees should be allowed to perform procedures such

as intraocular pressure measurement, foreign body removal and minor surgeries.

“Preferable in a center where there is a lot of hands-on experience and exposure to a variety of ophthalmology cases”

4. Basic equipment: 8(15.1%) said basic equipment should be made available in the General Out-Patient Clinics.

“Simple equipment should be made available at GOPD for easy usage.”

Findings during the on-the-spot assessment of ophthalmic diagnostic equipment available was that only one institution had 2 visual acuity charts, one diagnostic set and one of the physicians was seen taking visual acuity of a patient who had an eye complaint.

DISCUSSION

To the best of the authors knowledge, this is the first survey of impact of ophthalmology rotation on practice among Family Physicians in Nigeria. We did not directly compare training institutions, but rather provided selected institutions as a possible current benchmark for the country and reference for future comparison.

This cross sectional observational study attempted to quantify the adequacy of undergraduate and postgraduate ophthalmic education and Family Physicians’ comfort with respect to the management of ocular conditions and self-rated ability in performing basic ophthalmic skills. During undergraduate study, ophthalmology posting takes place during the senior Surgery posting alongside with other sub-specialties such as Anesthesia and Otorhinolaryngology. In consonance with the Medical and Dental Council of Nigeria (MDCN), National Postgraduate Medical College of Nigeria (NPMCN) and West African College of Physicians (WACP) recommendations, most of our study participants received the 4 weeks of ophthalmology rotation which with majority reported the experience as average. Reasons some respondents spent 6 to 8 weeks during undergraduate training may be due to a re-sit surgery exam while in postgraduate it could be the choice of the physician or

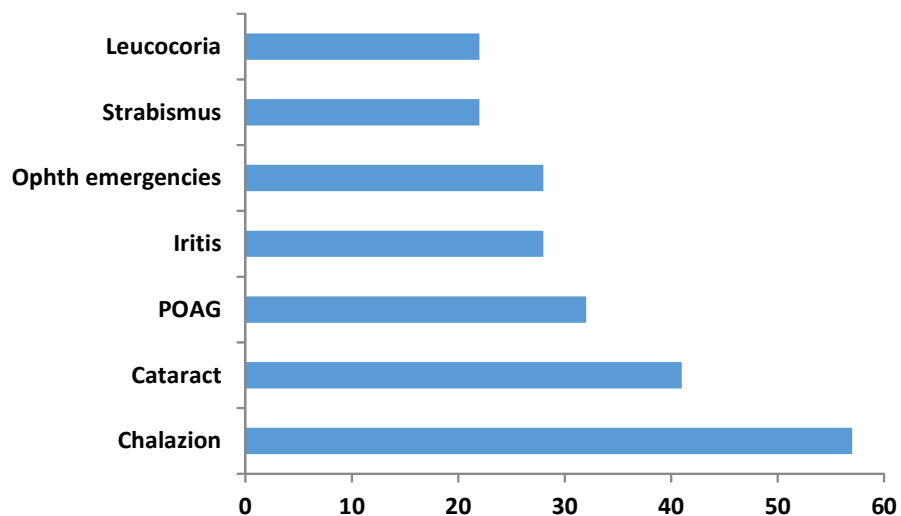


Fig. 2: Respondents with Adequate Knowledge in Diagnosing Common Ophthalmic Conditions.

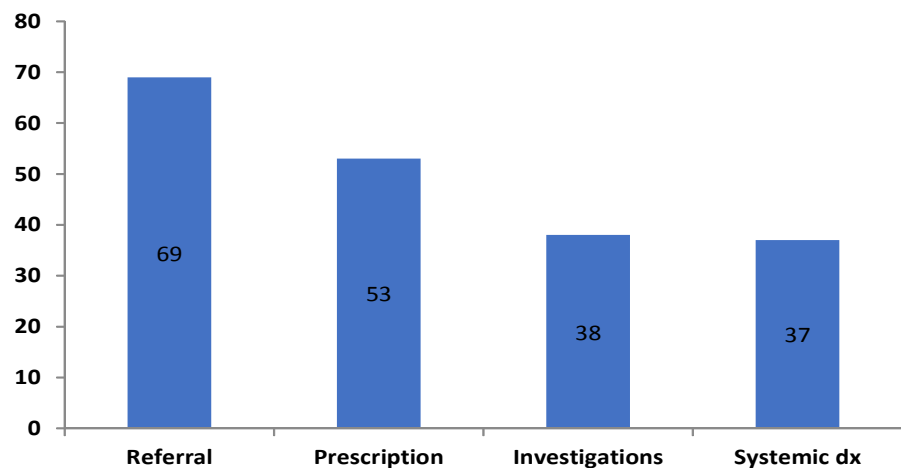


Fig. 3: Physicians with Satisfactory Knowledge.

recommended by the trainer to achieve competencies.^{9,10} Most of the respondents had a post-graduate rotation in ophthalmology with 9 junior residents yet to go for their training. This is unlike in the United Kingdom (UK), where 96% of General Practitioners (GPs) do not undergo postgraduate ophthalmology training.¹¹ Currently, there is a call for renewed activism from ophthalmologists to prevent extinction of ophthalmology clerkship in UK and USA medical schools.¹² Posting at both under and post-graduate levels, if properly utilized is expected to improve knowledge and skills of our general practitioners when compared to their counterparts from the UK. Responding Family Physicians' years of experience did not seem to affect

their level of comfort possibly an indication of reinforcement of continuous ophthalmology knowledge from undergraduate to post graduate level.

At undergraduate level, students are methodically exposed to acquire knowledge, relevant basic skills in the diagnosis, investigation and treatment of disease in the ophthalmology.¹⁰ This forms a bedrock for the postgraduate study where goal of posting is to demonstrate competence in recognition and appropriate management of eye disease in primary care. In addition to systemic assessment, trainees should be able to assess patients for visual impairment through history, visual acuity test, carry out fundal examination with ophthalmoscope, diagnose and manage

common inflammatory eye conditions listed in the cognitive section as well as recognize and refer corneal ulcers, cataract, glaucoma and other serious eye diseases.⁹

We found that the proportion of eye related consultation reported were highest at the extremes of 1–5% and >20% which was unlike South Africa where GPs gave an estimate of 10-20% of all their patients seeking eye care.¹³ It is similar to a study in the UK where 2–5% of GP consultations were eye related, an implication that eye consultations make up significant proportion of all GP consultations. Hospital Electronic Health Records system would be a great advantage to tease out this proportion of the multi-specialist consultations to give a subjective figure and for comparison.

Most of the participants in the study reported a satisfactory level of comfort in diagnosing common ophthalmic problems but an objective measure of skills would be needed to confirm this claim. The fact that about two-thirds reported a satisfactory level of comfort in diagnosing cataract is encouraging since cataract is the leading cause of preventable blindness in the developing world. This is slightly lower than finding in study among undergraduates in South India where 97.3% students could comfortably diagnose cataract.⁵

Although ophthalmic emergencies were lumped together, our respondents like the Indian students had inadequate knowledge in diagnosing them and similar to Canadian resident doctors with low median scores for acute angle glaucoma, orbital cellulitis, ocular chemical burns, ischemic optic neuropathy secondary to giant cell arteritis.^{5,15}

Considering the risk of vision loss and impact on quality of life, the role of early detection of these conditions is of paramount importance. Patient referral to specialized service providers is a fundamental aspect in Primary Health Care with the Family Physician serving as a coordinator. All respondents except one reported adequate knowledge in referral to eye clinics. This could be because of the fear that any delay especially for ophthalmic ocular

emergencies could worsen visual outcomes so the GPs quickly refer the patients. Despite the fact that referral rates are a key indicator for the functioning of healthcare systems, a high rate of referral without triage would place pressure on the limited resources of ophthalmic outpatient clinics.¹⁶ An estimated 50% of all 'walk-in' eye clinic referrals at Groote Schuur Hospital were from GPs with impression of misdiagnosis or incorrectly treated blinding conditions.¹³

More than two-thirds of respondents reported proficiency in performance of ophthalmic skills except tonometry. Seventy percent were comfortable with direct ophthalmoscopy compared with 41% of undergraduate in an Indian study. This could be due to more hands-on training with fewer residents compared to number of students during a posting period. Ability to easily carry out skills like history taking, color vision testing and pupil examination are relevant not only in ophthalmology but also in general medicine, neurology and trauma care.^{12,17}

Globally and specifically in Nigeria, glaucoma remains the leading cause of irreversible blindness, proficiency in tonometry by primary care physicians cannot be over emphasized. Fortunately, there are easy to use tonometers such as Icare instead of the cumbersome schoitz or those requiring slitlamps. Ability to measure intraocular pressure the modifiable risk factor for glaucoma; will help in early diagnosis, treatment and referral, thereby reducing the risk of visual loss from glaucoma. Despite 70% feeling comfortable to do direct ophthalmoscopy, only JUTH had diagnostic set with ophthalmoscope and visual acuity charts on the wall. This further buttress the suggestions that basic eye care equipment be made available at the general out-patient clinics. A similar intervention was implemented at Birchwood Medical Practice Lincoln where eye kits were provided for the GPs. The doctors reported that the eye kits were a useful addition to their consultation room equipment, as it kept everything needed in one place and visual acuity screening increased from 35% to 69%.¹⁴

Rather than wait for the bureaucracy of procurement of equipment in the hospitals, a suggestion that would improve physician's skill is ownership of an arclight ophthalmoscope which is not cumbersome, does not need light and has additional scopes for ear examination.¹⁸ The knowledge on indications of medical treatment was reported as adequate. With a significant shortage of ophthalmologists in developing countries, an adequate level of comfort of primary care physicians in managing basic eye conditions would go a long way in ensuring no one goes needlessly blind. To encourage our Family Physicians to continue to keep an eye on our eye patients, there is need for refresher training and audit of referrals from the out-patient departments.

Critical suggestions were task-oriented training and the need to tailor training to curriculum. There has been clamor both at undergraduate and postgraduate levels for a shift from traditional "apprenticeship model" which has been the mainstay of graduate medical education in which an experienced "master and mentor" trains the trainee. This has wide variability and lacks standardization across the range of performance among programs and individuals. In Canada, innovative education methods such as computer-assisted or web-based learning have been suggested. This could be done through the collation of anterior or posterior segment pictures for virtual reviews during training. Ophthalmology upskilling courses/workshops through collaboration between the faculties of Family Medicine and Ophthalmology for the enhancement of ophthalmic skills over a range of important ocular examination and procedures. Inter-departmental presentations as well as MDT meetings would be a great learning opportunity.^{13,15,17,19}

Our study was in two closely bordered states, although undergraduate study was widespread among respondents, generalization of results may be limited. With high non-response rate in this study, our results might have been under or overestimated hence, conclusions must be drawn with caution. Also, respondents may not have

accurately self-evaluate themselves due to recall bias because assessment is not at the exact time of posting. An interventional study of respondents before their ophthalmology posting and few months after would provide more insight to knowledge compared to the college recommendations and gaps in training.

In conclusion, ophthalmology training is a pivotal part of undergraduate and postgraduate studies in Nigeria. Family physicians reported being comfortable in managing ophthalmic conditions. Only one of the study hospitals possessed basic ophthalmic examination equipment. There is a need to objectively measure Family Physicians' ophthalmic skills to ensure that eye patients seen first by Family Physicians receive appropriate treatment. It is hoped that these findings would be useful to colleges in accreditation and training curriculum.

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Conflicts of Interest

The authors report no conflict of interest.

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