

Self-Reported Eye Care Knowledge and Practices among General Practice Physicians in Anambra State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Doctors in general medical practice (general practitioners) and other health care professionals are important participants in primary eye care as not all eye diseases need specialist care, and people with eye diseases would not all be able to access eye care specialists. Therefore, the knowledge and practices of a general practitioner to eye diseases are important because a misdiagnosis of an ocular condition could be deleterious to sight.

Aim: To assess the knowledge base and practices of general practitioners in eye care delivery.

Materials and methods: The study design is a cross-sectional survey of physicians in general practice using a self-administered semi-structured questionnaire. Information on duration of practice, self-reported knowledge and practices of eye care, types of eye diseases managed, medications used and criteria for referral were obtained from the participants.

Results: One hundred and fifteen general practitioners were interviewed. Their mean duration of

practice was 25.5 ± 10.3 years. Of the participants, only 6 (5.2%) had done refresher course in ophthalmology. However, 73(63.5%) general practitioners asserted their knowledge in ophthalmology was adequate. Eighty-three (72.2%) consulted and treated eye diseases in their practice. The most common of such were conjunctivitis, trauma, foreign body, blepharitis and ophthalmia neonatorum. Common medicines used were eye drops and ointments consisting of antibiotics, and steroid/antibiotics combination, antihistamines, non-steroidal anti-inflammatory drugs, and anti-glaucoma medications. Criteria for referral were eye diseases beyond their competence, defective vision, and systemic diseases with potential blinding complications. A majority 94.8% desired continuing medical education to increase their capability in eye care.

Conclusion: Spectrum of eye diseases treated, and medicines used are within expectations of participation of general practice doctors in primary eye care. Criteria for referral to an ophthalmologist are reasonable. However, methods for imparting requisite medical knowledge are advocated for these group of practitioners to prevent misdiagnosis and potential loss of sight.

Keywords: Eye care; Eye diseases; General practitioners; Knowledge; Practice.

1. INTRODUCTION

The non-ophthalmologists are the first port of call for most patients with eye problems in Nigeria. Some patients may never have access to an ophthalmologist. The reason being that ophthalmologists are few and mostly located in the urban areas, while most of the people dwell in rural areas [1]. Among the people living in the urban areas, many are ignorant of the presence and role of ophthalmologists [2]. In a study carried out in secondary schools in Enugu metropolis, significant ocular morbidities were seen among the students, predominant of which were conjunctivitis, ametropia, stye, squints, accommodation deficiency, and convergence insufficiency; but very few had ever consulted or were referred to an ophthalmologist [3]. Yet the same town harbors notable tertiary and secondary health care facilities with established ophthalmic departments [3]. Many patients resort to general practitioners because of familiarity [3-4]. Ophthalmologists in Nigeria have for years tried to ameliorate care deficits for eye conditions in urban and rural areas by conducting outreaches by which specialized eye care services are taken to the various communities [5-7]. This mode of care can only be a temporary solution as the ad hoc and episodic visits by the eye care team cannot solve eye care needs of the people permanently nor provide adequate follow-up. The model of eye care preferred that will provide care at first contact for the people is the 'Primary Eye Care' integrated into the "Primary Health Care" services. This term 'Primary Eye Care' describes affordable and accessible eye care system not focused primarily on ophthalmologists, but on others including general practitioners who are conversant with

use of modern methods demanded by modern health care management [8-12] Given their numbers and geographical spread, other health care professionals such as the optometrists, ophthalmic nurses and general physicians have been suggested to be trained, empowered and given roles as integral part of eye care services, beyond what might be strictly construed as their traditional designated field, for effective community eye care cover [13-15]. Doctors in South Africa who carry out some primary eye care services possess some knowledge and skills in the management of eye diseases [16,17]. The study showed that most general practitioners felt that as the primary health care workers, they should play a greater role in primary eye care delivery [16,17]. Therefore, for effective discharge of this duty, they needed acquisition of better skills for more competent eye care delivery [16,17]. Due to insufficient and maldistribution of ophthalmologists in Nigeria, general practitioners may have to get more involved in primary eye care delivery as enunciated by the World Health Organization (WHO) in 1984 [18-21].

2. AIM

To assess the knowledge base and practices of general practitioners in eye care delivery.

3. MATERIALS AND METHODS

This was a prospective cross-sectional study among general practitioners in Anambra State. It was conducted on the 5th to 31st of August 2021. For this study, a general practitioner was defined as a medical doctor in general practice with basic medical qualification, who is engaged in active

practice but have had no further ophthalmic training.

3.1 Sample Size

The sample size was calculated estimated using the formular [22] $n = \frac{Z^2 P(1-P)}{d^2}$ Where n is the desired sample size, Z is corresponding to the confidence level (at 95% confidence level, Z= 1.96 prevalence rate generated by Van Zyl [17] and co-investigators who in a survey found the mean self-rated knowledge of non-ophthalmic physicians in Cape town concerning eye diseases to be 51.9%, d is the degree of accuracy desired, set at 5% (0.05). substituting the values, n= 384.

As at 14th July 2021, the total number of registered general practitioners in Anambra State is 140.

Since the population to be surveyed is less than 10,000, therefore the Cochran's formula [23] for determining sample size in small samples using results obtained from calculation for large samples was used. $S = \frac{n}{1 + \frac{(n-1)}{N}}$, where S is the adjusted sample size to be determined, N is the study population size (140), n is the sample size determined for large sample size (384). Substituting the values, S= 103. Because of the high likelihood of non-response rate, an attrition of 20% was added (103 + 20= 123). Therefore, the calculated sample size was 119.

3.2 Sampling Design and Data Collection

Participants were selected from the list of registered general practitioners using the simple random sampling technique without replacement. Data was collected on all eligible participants using a pretested self-administered semi-structured questionnaire which underwent face validity. The questions were on the duration of practice, self-reported knowledge of eye diseases, eye diseases encountered during practice, eye medications used to treat eye diseases, and criteria for referral of eye problems to an ophthalmologist. The response to the question 'Should training in ophthalmology form a significant part of the Continuous Medical Education (CME) for doctors?' was also elicited from the participants. On adequacy of knowledge in Ophthalmology, participants were asked to rate themselves using a 3- point rating scale of adequate, inadequate or undecided. The study

period coincided with the Nigerian Medical Association Anambra State annual general meeting/ scientific conference which held on the 5th and 6th August 2021. Sixty-one questionnaires were distributed during the conference to the selected participants who were present. The remaining 58 were contacted through telephone and electronic copy of the questionnaire were mailed to them. Participants who could not be reached via telephone twice, on two different occasions were replaced.

3.3 Inclusion Criteria

Consenting registered general practitioners practicing within Anambra State, Nigeria at the time of the study.

3.4 Exclusion Criteria

General practitioners practicing outside the state and non-consenting general practitioners.

3.5 Data Analysis

Information obtained were cleaned, coded, and analyzed using the Statistical Package for Social Sciences (SPSS) version 23 (IBM Corp.). Frequencies of the variables were analyzed. Test for statistical significance was done with Chi-square, with level of significance was set at P<0.05. Data representations are in form of frequency tables and bar charts.

4. RESULTS

A total of 115 questionnaires were returned, with a response rate of 93.5% (115/123). They comprised 101(87.8%) males and 14(12.2%) females. Their mean years of practice was 25.5 ± 10.3 years, with a range of 1 to 47 years. Majority, 75(65.2%) were in private practice; 23 (20.0%) were in government/public service, and 17(14.8%) were in both private and public practice.

Among the participants, 109 (94.8%) had not done any refresher course in ophthalmology, while 6 (5.2%) had. On inquiry of their view on adequacy of the knowledge of ophthalmology being sufficient for their current practice, 73(63.5%) asserted it was adequate, 40(34.8%) posited that it was not; while two (1.7%) were undecided. This is shown in Fig. 1. The self-rating of general practitioners with adequate knowledge was 63.5% (95%CI: 54.7 - 72.3).

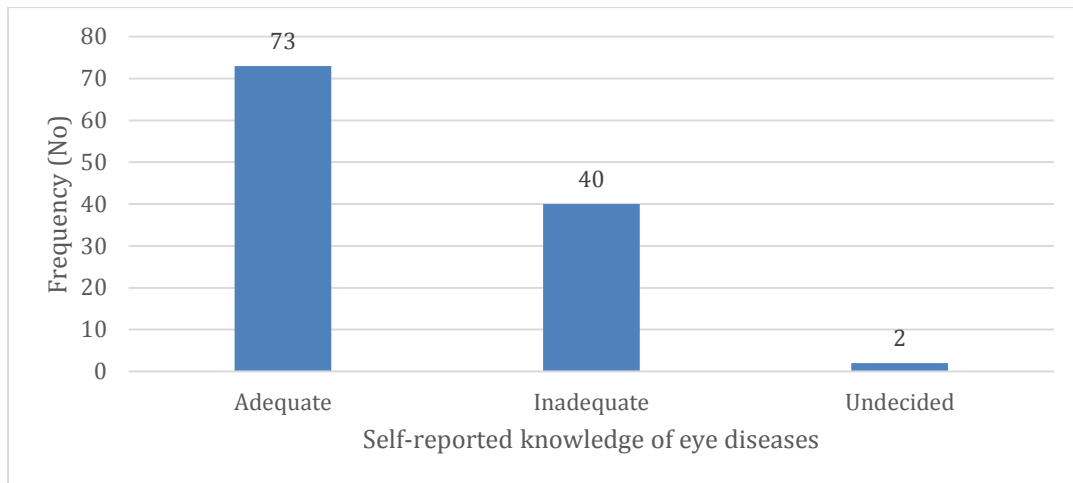


Fig. 1. Participants rating on their knowledge of eye diseases

There was no significant association between a general practitioner’s place of work (private or public sector) and their claim of adequacy of knowledge in ophthalmology ($\chi^2 = 2.1$, $P = 0.723$). Eighty- three (72.2%) participants had treated some eye diseases that presented at their practice, while 32(27.8%) had not treated any type of eye disease. People who had extra course on eye diseases were more likely to treat eye diseases than those who did not (Likelihood ratio value 11.5, $P = 0.022$). Those who asserted adequacy of knowledge in ophthalmology were more likely to treat eye diseases seen in their clinics than those who do not (Likelihood ratio value of 12.4, $P= 0.014$).

Eye diseases encountered by general practitioners in their clinics are shown in Table 1.

Table 1. Eye diseases seen by the general practitioners*†

Eye diseases	Frequency (Percentage)
Conjunctivitis	99(86.1)
Trauma	19(16.5)
Refractive error	11(9.6)
Ophthalmia neonatorum	6(5.2)
Foreign body	4(3.5)
Glaucoma	3(2.6)
Blepharitis	3(2.6)
Stye	1(0.9)
Keratitis	1(0.9)
Cataract	1(0.9)
Pterygium	1(0.9)
Trachoma	1(0.9)

*Responses from 102 (88.7%) participants; 13 (11.3%) gave no response. †11 (9.6%) participants gave multiple responses

Eye medications prescribed by general practitioners who treated patients with eye complaints are presented in Table 2.

The criteria for referring patients by the general practitioners to the ophthalmologists are shown in Table 3. There was no significant association between a general practitioners’ place of work and having a criterion for referral to an Ophthalmologist ($X^2 = 1.1$, $P = 0.897$).

The participants responses on whether training in ophthalmology should be a significant part of the continuous medical education (CME) for doctors are shown in Fig. 2.

People who declared desire for ophthalmology to be a prominent part of CME for doctors were significantly more than those who do not ($P= 0.008$). There was no association between the place of work of a general practitioner and a desire for increased content of ophthalmology in CME ($P = 0.247$). Those who treated eye diseases were significantly more likely to declare desire for Continuing Medical Education to have substantial ophthalmology content (Likelihood Ratio value 16.3, $P= 0.003$).

5. DISCUSSION

5.1 Demographic

The duration of practice of the participants showed a mean duration of practice of 25.5 years and this is an indication that most of the doctors practicing in Anambra state of Nigeria are graduates of two decades and above. Result from this study also demonstrates that

preponderant medical services in Anambra state is rendered by doctors in private practice, as 65.2% of the participants declared they were in full private practice. The concentration of physicians who take care of the citizens are in

the private sector, this suggests that any effort to influence medical policy or practice as regards eye care must focus on them as major participants.

Table 2. Eye medications prescription by general practitioners*

Eye medications (Eye drops and ointments)	Frequency (Percentage)
Chloramphenicol	75 (65.2)
Gentamicin	52 (45.2)
Steroid and steroid-antibiotics combination eye drops	33 (28.7)
Anti-allergic eye drops	21 (11.5)
Penicillin ointment	7 (6.1)
Tetracycline	7 (6.1)
Non-steroidal anti-inflammatory agent eye drops	2 (1.8)
Antiglaucoma agents: timolol, xalatan	2 (1.8)
Ciprofloxacin	2 (1.8)
Albucid eyedrop	1 (0.9)

*12 participants prescribed multiple medications

Table 3. Criteria for referral of eye disorders to ophthalmologists*†

Criteria for referral to Ophthalmologists	Frequency (Percentage)
Eye conditions I do not understand or cannot treat	113 (98.3)
Those with defective vision	66 (48.7)
Patients with systemic disease and its blinding complications	43 (37.4)
All Eye symptoms	24 (20.9)
Patients with red eyes	7 (6.1)

*Responses from 110 (95.7%) participants; 5 (4.5%) gave no response.

† 23 (20.0%) participants gave multiple responses

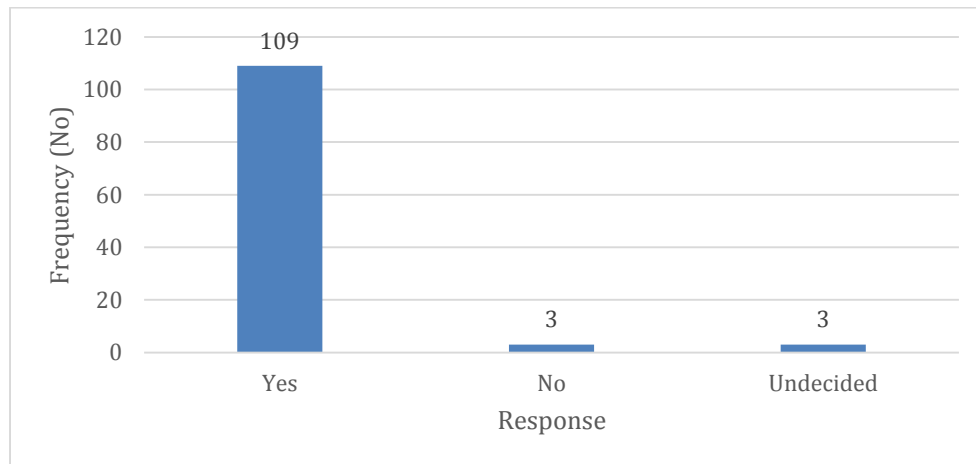


Fig. 2. Participants response to the question, 'Should training in ophthalmology form a significant part of the Continuous Medical Education (CME) for doctors?'

5.2 Adequacy of Ophthalmic Knowledge

Majority (63.5%) of the participants rated their knowledge in ophthalmology as being adequate for practice. This was higher than the mean self-rating of 51.9% on the knowledge of eye

diseases among general practitioners in South Africa [17]. De Lange reported a lower self-rating of 20.2% among general practitioners in the Vaals Triangle in South Africa who rated their knowledge of common eye disease to be above average [24].

Most general practitioners owned up to treating eye diseases in their practice, as part of their regular work. This compares with situation in south Africa where a survey of majority of general practitioners owned up to treating eye diseases in their practices [16]. In the index study, since the actual test of the content of knowledge was not ascertained, the accuracy of this knowledge cannot be confirmed. In a population with a high personal rating on the knowledge of eye diseases, a mean duration of medical practice of over 2 decades, and with majority who had not undergone refresher course in ophthalmology, the accuracy of the content of knowledge of eye diseases and treatment is questionable. Statham et al in Australia reported that 35.9% of the patients referred by the general practitioners, and 48.2% of patients referred by the optometrists to the ophthalmologists matched the final diagnosis made by the ophthalmologists [25]. In west Indies, only 29% of the patients referred to the ophthalmologists by general practitioners were correctly diagnosed [26]. This implies that even in a more developed nation, there is a high likelihood of inaccurate diagnosis made by non-ophthalmologists. Therefore, there should be regular ophthalmic updates for general practitioners.

5.3 Eye Diseases Encountered and Treated

Enquiry for a list of the eye medications prescribed by the participant yielded results in "Table 2". Drug profile indicates that eye diseases treated are mostly confined to infective and allergic conjunctivitis. It is clear that the medicines used reflect diagnoses entertained as displayed in "Table 1". Antibiotics were the commonest medications used as eye drops or eye ointments, and different types were used. There is marked use of steroid eye drops and ointment, sometimes in combination with antibiotics. Also utilized were anti-allergic eye drops and non-steroidal anti-inflammatory agents. These medications were probably utilized for vernal conjunctivitis which is very common in Nigeria.

It was not explored what guided the choice of particular formulations nor how effective they were in treating the conditions for which they were deployed. Enquiries were also not made on the criteria for the various diagnosis that led to the choice of medications used. Although the choice of agent deployed agrees with the accepted management of different types of

conjunctivitis, namely bacterial, allergic, and viral types of conjunctivitis [27-28] worrisomely is the increased number of general practitioners who used steroids in the management of eye diseases. Due to the adverse effect of topical steroids especially in cases of misdiagnosis, Claoue and Stevens recommended that general practitioners should not use steroids without first seeking the opinion of an ophthalmologist [29].

Though formal update courses were undertaken in eye care by only 5.2% of the physicians, they nevertheless had good knowledge of modern medications used in the treatment of eye diseases. Sources of such knowledge acquisition was not investigated, it is documented that drug representatives of pharmaceutical companies, colleagues, medical conferences and scientific journals are sources of such information to doctors [30].

5.4 Referrals

Referrals of eye diseases to ophthalmologists by non-ophthalmologists are for a plethora of reasons as indicated in "Table 3". Majority (48.7%) referring for defective vision, and 20.9% for all eye complaints whatsoever. It is not clear why such a large subset does not treat any form of eye diseases. It is an area for future inquiry as it is desirable for all physicians to be able to treat at least conjunctivitis. This is due to the inadequate numbers and spread of ophthalmologists in Nigeria, as most referred patients could find it difficult to access ophthalmologists, who are mostly situated in eye centers in urban areas.

Among the participants, 94.8% of the doctors desired that ophthalmology should be a prominent part of Continuing Medical Education for doctors to improve their competence. This compares with views of a group of doctors in South Africa who also felt a need for more ophthalmic knowledge to reasonably treat eye diseases [17]. It is clear that doctors in general practice come in contact with patients with several eye diseases. The spectrum of eye diseases consisting mainly of adnexal lesions and ocular surface infections/inflammations presenting to this group of practitioners is useful information because it informs where efforts should be concentrated in increasing knowledge and intervention expertise of general practitioners. These diseases incidentally form the bulk of those that primary eye care assigns for management to non-ophthalmologists [14-15].

The mean age of practice of 25.5 years of these practitioners, also suggests that update of their knowledge and practice is necessary and must be considered. Many of them as 94.8% have not had any extra course in ophthalmology since graduation. A system could be developed that enables more knowledge and skill for eye care to be imparted to general practitioners and other interested non-ophthalmic medical practitioners, so that a higher proportion of them would be empowered to effectively treat less complex eye problems. Methods for imparting requisite medical knowledge is by eye care topics to form a major part of Continuing Medical Education for doctors in a systematic fashion, and possibly organizing short courses for interested general practice physicians to participate.

6. CONCLUSIONS AND RECOMMENDATIONS

A large proportion of physicians in general practice who do not have specialist training in eye care are consulted by patients for ophthalmic problems. Majority of them treat these patients relying on knowledge acquired many years ago and during medical school training. Unfortunately, some believe such knowledge and skill are adequate for routine practice although they desire more training to acquire more competence in treating eye diseases. The diseases treated appear to be within the areas of their expected knowledge base and major medications dispensed appear to broadly match the diagnoses they entertained. It must be conceded that those who entertained ophthalmic diseases within their practice operated within the areas of their competence, and they have commendable referral criteria. They must be reinforced by appropriate training and updating of skills and knowledge as medicines used though used for many years, newer and more effective formulations have come into use. Study should be done on the large percentage that declared that they do not treat any eye disease at all. They should be encouraged and empowered to do so since general practitioners are an integral and important part of primary eye care.

ETHICAL APPROVAL

Ethical approval was obtained from the Medical and Health Research Ethics Committee of the Nnamdi Azikiwe University Teaching Hospital (NAUTH), with reference number NAUTH/CS/66/VOL.13/VERIII/08/2020/05.

CONSENT

Written informed consent was taken from each participant with privacy and confidentiality maintained. Access to data was limited to those directly involved in the study. All aspects of the study were conducted according to the Good Clinical Practice and Good Laboratory Practice guidelines. Confidentiality of the participants information were securely stored and identified by numbers. This study was conducted according to the tenets of the Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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