

Pattern of Referrals by Optometrists in Nigeria in Relation to Glaucoma and Diabetic Retinopathy

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ABSTRACT

Background: Referrals from primary care practitioners such as optometrists to other health care providers is critical to the health care delivery system of any society.

Aim: To explore the patterns of referrals of Nigerian optometrists with respect to glaucoma and diabetic retinopathy.

Methodology: A cross-sectional exploratory survey using a 28-item questionnaire was administered to optometrists attending the 37th annual general meeting of the Nigerian Optometric Association. Responses were coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 17. Appropriate descriptive and inferential statistics were used to report the pertinent findings of the study relevant to the study objective.

Results: About 70% and 93.1% of respondents refer glaucoma and diabetic retinopathy patients respectively to other care givers mainly ophthalmologists. Majority initiate treatment before referral. Female optometrists were more likely to refer both conditions. Both male and female respondents were more likely to refer diabetic retinopathy than glaucoma patients.

Conclusion: Majority of Nigerian optometrists refer glaucoma and diabetic retinopathy patients to ophthalmologists; though more than half of the respondents will initiate treatment for glaucoma before referral. However prompt referral is highly advocated.

KEYWORDS: Optometry, Ophthalmology, referral, Nigeria, glaucoma.

Introduction

The World Council of Optometrists (WCO) states that "Optometry is a healthcare profession that is autonomous, educated and regulated (licensed/registered) and Optometrists are the primary healthcare practitioners of the eye and visual system, who provide comprehensive eye and vision care, which includes refraction and dispensing, detection/diagnosis and management of disease in the eye and the rehabilitation of conditions of the visual

system"¹. Optometrists are primary eye care professionals whose scope of practice in Nigeria is defined by the Optometrists and Dispensing Opticians Decree No 34 of 1989 (now Act Cap 09, Laws of the Federation of Nigeria 2004). Inherent in this Act is that in the day to day practice of Optometrists, there are certain ocular conditions that are beyond the scope and competence of the Optometrist and must therefore be referred to the ophthalmologists (who are medically qualified eye care physicians and surgeons) for further management. The practice of a referral system is to all intents and purposes in the patients' interest. It is to ensure that the patient is given the best of care available.

There are anecdotal instances where optometrists have been criticized for practicing beyond the scope of their practice and competence in Nigeria especially in relation to glaucoma and other posterior

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segment disorders. In advanced countries there are stipulated pathways for referral^{2,3}. In Nigeria, no such clinical referral pathway exists. The Optometrists and Dispensing Opticians Decree No 34 of 1989 (now Act Cap 09, Laws of the Federation of Nigeria 2004 which regulates the practice of Optometrists in Nigeria, has not clearly defined the management protocol for glaucoma and diabetic retinopathy. There are no criteria set for referral of these conditions to the ophthalmologist either. Thus in the absence of clear cut referral pathways, referral practices are determined by individual primary care providers based largely on perceived competence rather than scope of practice. A common point of conflict between optometry and ophthalmology in Nigeria is the concern that some optometrists fail to refer patients needing ophthalmologic consult or do so belatedly. Perhaps primary open angle glaucoma which portends dire consequences when early intervention is not initiated is one of such conditions often blamed on optometrists. There is a paucity of studies exploring the referral interaction between optometry and ophthalmology in Nigeria with respect to glaucoma and diabetic retinopathy. To provide empirical evidence to address this gap in knowledge, we set out to investigate the referral behavior of Nigerian optometrists with respect to glaucoma and diabetic retinopathy. The study also explored the types of diagnostic tests Optometrists perform in order to diagnose glaucoma. We conducted a preliminary survey to investigate the pattern of referrals by Optometrists in Nigeria with respect to glaucoma and diabetic retinopathy.

Materials and Methods

We conducted a cross sectional survey using a structured self-administered questionnaire to elicit responses from Optometrists attending the 37th Nigerian Optometry Association (NOA) Conference and Annual General Meeting (AGM) in Umuahia, Abia State in July

2013. The 28-item questionnaire was divided into four sections. Section A asked questions relating to the respondents' demographic and practice history as well as where respondents obtained their training; sections B - D asked questions relating to referral practice with respect to glaucoma and diabetic retinopathy. The questionnaire was designed such that no identifying information about the respondent was given. Furthermore, a note in the questionnaire sought consent of the respondents and guaranteed their confidentiality. Ethical approval to conduct the study was obtained from the Ethics Committee of the Department of Optometry, University of Benin. A total of 100 questionnaires were randomly distributed to attendees at the NOA conference/AGM. With attendees seated at different section of the auditorium during the plenary session, approximately every tenth person was given the questionnaire to ensure randomness. The questionnaires were filled and returned within 30 minutes of distributing them. Responses were coded and analyzed using the statistical package for social sciences (SPSS) version 17(IBM Corp). Appropriate descriptive and inferential statistics were performed. Binary logistic regression analysis was performed to predict referral patterns of Optometrists. Results are presented in tables and appropriate charts.

Results

Out of a total of 100 questionnaires administered, 61 were returned. Of these, two questionnaires were incompletely filled while one questionnaire was returned without being filled. This gave a participation rate of 58%. Thus analysis was based on the 58 questionnaires that were optimally filled. The participants comprised 28 (48.3%) males and 30 (51.7%) females. Of the 58 respondents, seven did not indicate their age. The mean age of the remaining 51 respondents was 35.71 ± 7.85 years. They were aged between 23 - 53 years. The male respondents were



significantly older than the female respondents ($p = 0.043$). Two respondents did not indicate their type of practice. Seventeen

(30.4%) respondents were in hospital practice while 15 (26.8%) were employed in an

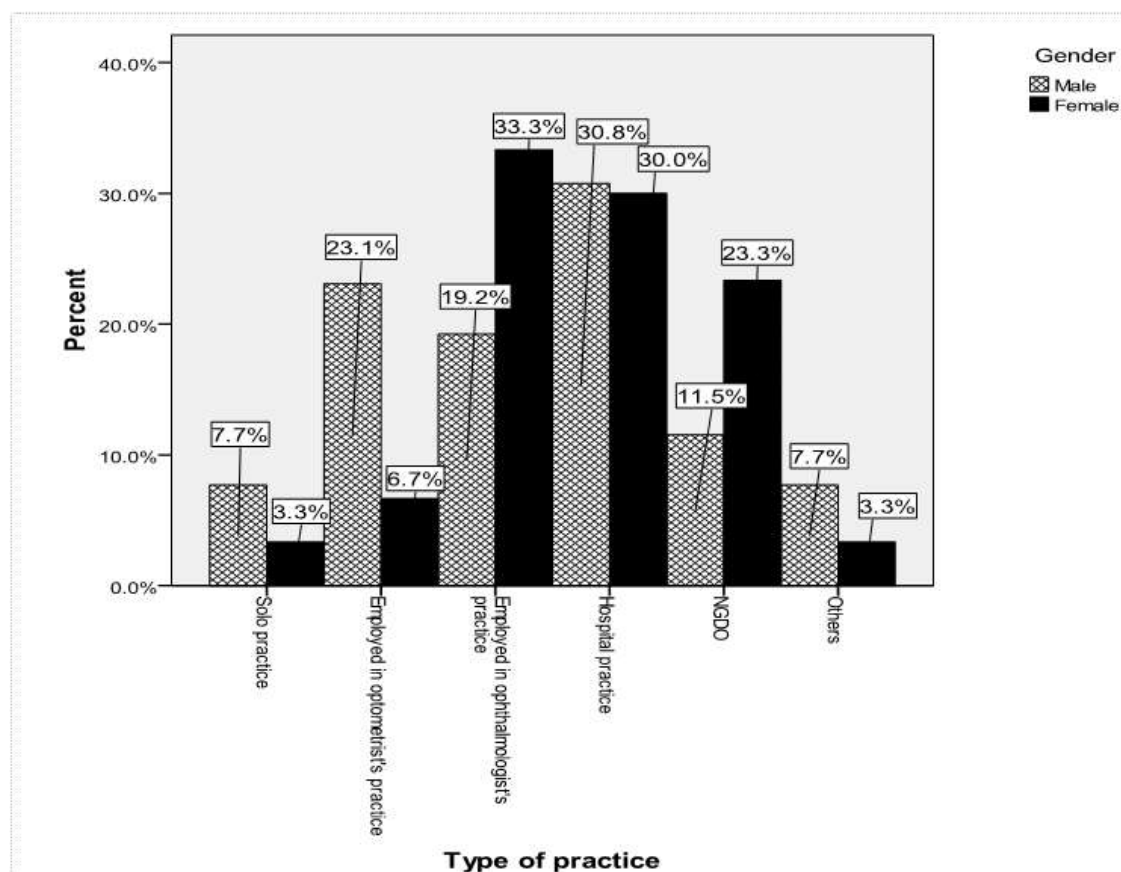


Figure 1: Mode of practice of respondents

More females were employed in Ophthalmologists' practice, hospital practice and in Non-governmental development organization (NGDO) while more males are in private practice solely owned by the Optometrist and employed in Optometrists' practice.

Nine (15.5%) out of the 55 who reported their practice location practice in Rivers State while six (10.3%) practice in Abia State. Other States had fewer respondents. Figure 2 shows the location where respondents practice. Five of

the six geo-political zones were represented albeit disproportionately. Only the North-East zone was not represented in the survey. Thirty-two (55.2%) of the total respondents have spent less than five years in practice. Table 1 shows the distribution of years in practice of the respondents. The mean year in practice of respondents, post-National Youth Service Corps was 7.26 ± 8.02 years with a median of 3.50 years. The range was less than one year to 30 years.

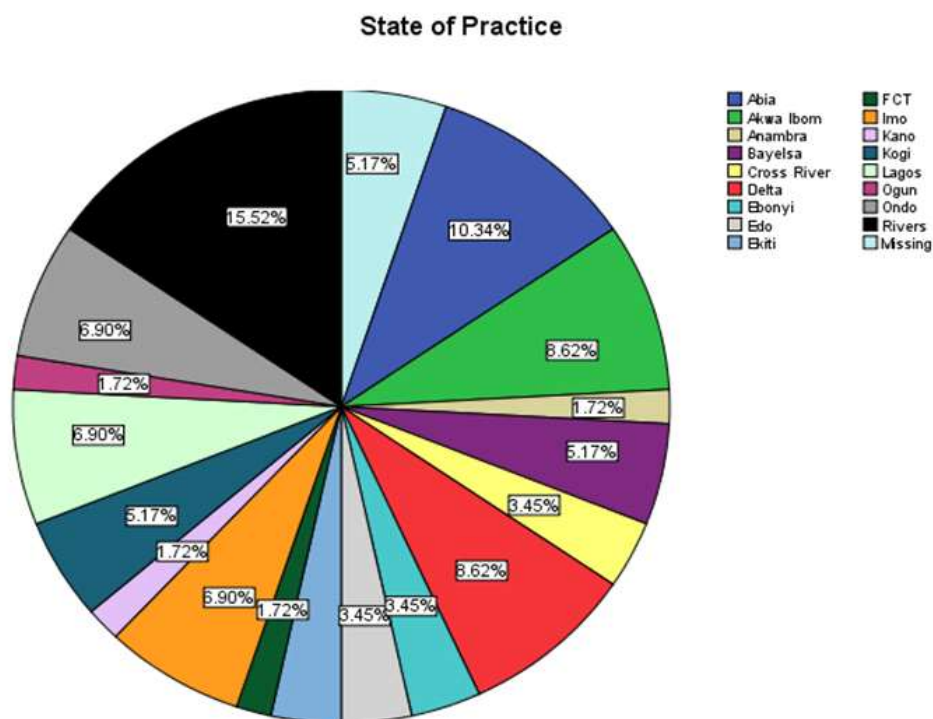


Figure 2: Practice location of respondents

Table 1: Distribution of number of years in practice of respondents

Years in practice	Gender		Total (%)
	Male (%)	Female (%)	
0.0-4.9	13 (46.4)	19 (63.3)	32 (55.2)
5.0-9.9	1 (3.6)	5 (16.7)	6 (10.3)
10.0-14.9	7 (25.0)	3 (10.0)	10 (17.2)
15.0-19.9	2 (7.1)	1 (3.3)	3 (5.2)
20.0-24.9	3 (10.7)	1 (3.3)	4 (6.9)
25.0-29.9	1 (3.6)	1 (3.3)	2 (3.4)
30.0-34.9	1 (3.6)	0 (0.0)	1 (1.7)
Total	28 (100.0)	30 (100.0)	58 (100.0)



Pattern of referrals by optometrists

Table 2: Types of tonometers used by respondents

Type of tonometer used	Frequency	Percentage
Schiotz Tonometer	26	44.8
Schiotz and Perkins Tonometer	4	6.9
Schiotz and Non Contact Tonometer	1	1.7
Goldmann Tonometer	5	8.6
Goldmann, Perkins and Non Contact	1	1.7
Goldmann and Non Contact Tonometer	2	3.4
Perkins Tonometer	8	13.8
Non contact Tonometer	10	17.2
Not reported	1	1.7
Total	58	100.0

Forty-four (75.9%) of the respondents reportedly performs visual field test (VFT) while 14 (24.1%) do not perform VFT. Of those who perform VFT, 26 (59.1%) do so in their practices while 17 (38.6%) refer patient to go for a VFT. One (2.3%) respondent reports performing the VFT in the practice or requesting the test from outside the practice.

A total of 31 (53.4%) of the respondents reported that they will initiate treatment for a glaucoma patients before referring the patient to an Ophthalmologist while another 10 (17.2%) will refer glaucoma patients outright to an Ophthalmologist. Also 16 (27.6%) of the respondents will initiate treatment and continue follow-up care for glaucoma patients. Only one (1.7%) respondent will initiate treatment and refer to an Ophthalmologist or continue follow-up care (Figure 3). More female respondents were likely to refer glaucoma patients to Ophthalmologists than male respondents (OR = 1.556, 95% CI = 0.488 - 4.963) although gender was not associated with referral pattern of respondents ($p = 0.186$). A logistic regression analysis to determine if gender,

institution where optometric training was obtained or whether the respondents performed VFT or not influence the referral of glaucoma patients showed that none of these variables were significantly associated with referral behavior of participants with respect to glaucoma patients ($p = 0.696$). After controlling for gender, optometrists trained in University of Benin were more likely to refer glaucoma patients than those trained in Abia State University (OR = 2.125, 95%CI = 0.575 - 7.858) while those who perform VFT are less likely to refer glaucoma patients than those who do not perform VFT test (OR = 0.738, 95% CI = 0.175 - 3.124).



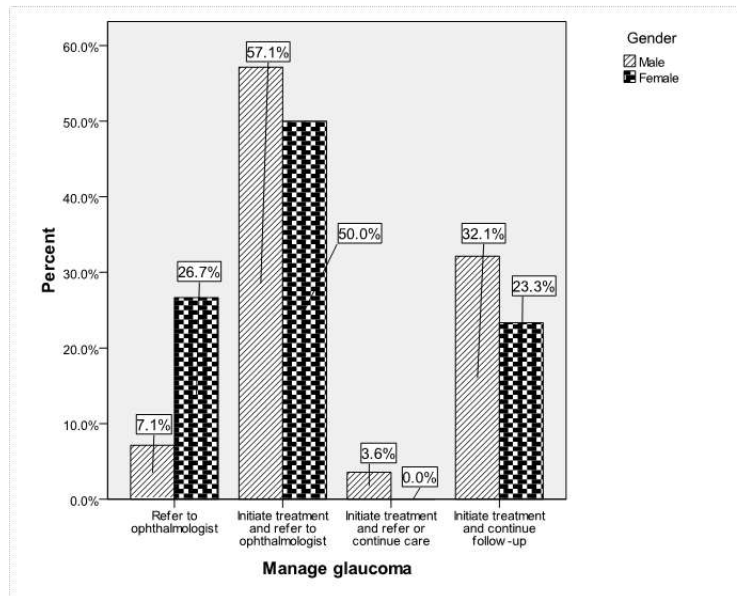


Figure 3: Action taken by respondents when a diagnosis of glaucoma is made

On the criteria for referring a glaucoma patient, 22 (44.9%) of those who responded to this question use large C/D ratio and raised IOP while another 21 (42.9%) use raised IOP and VFT results. Two (4.1%) respondents use IOP > 25mmHg while another four (8.1%) use varying combination of raised IOP, VFT results and large C/D ratio as criteria for referring glaucoma patients.

Whereas all 11 (100%) respondents from the South-West zone will refer glaucoma patients, six (46.2%) of 13 respondents from the South-East and 18 (69.2%) of 26 respondents from the South-South zone will refer glaucoma patients. Figure 4 shows the distribution of pattern of referral for glaucoma with geo-political zones.

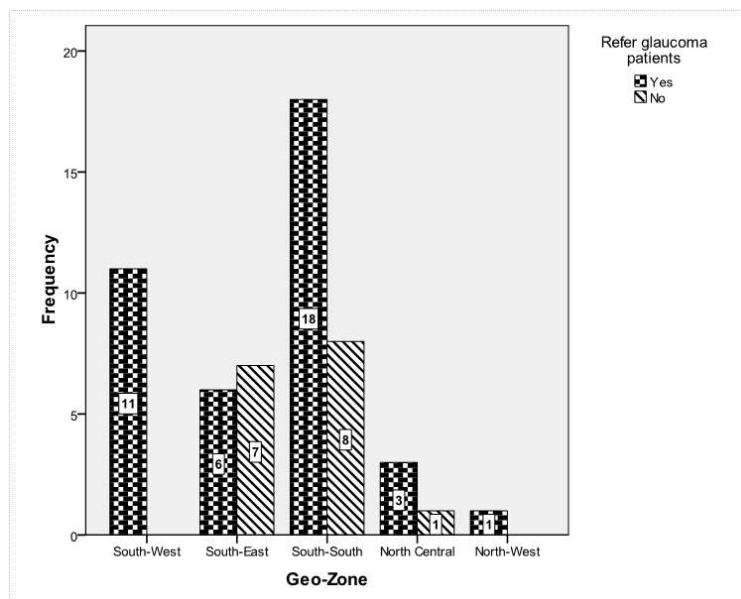


Figure 4: Referral pattern of glaucoma patients by geo-political zone

Pattern of referrals by optometrists

Referral pattern for diabetic retinopathy

Of the 58 respondents, 54 (93.1%) will request a fasting blood sugar test (FBST) from patients when a patient presents with ocular signs indicative of diabetes or diabetic retinopathy while four (6.9%) will not order for FBST. Number of years in practice ($p = 0.784$), gender ($p = 0.334$) and institution where a respondent was trained ($p = 0.707$) did not

influence ordering FBST. When diabetic retinopathy is observed in a patient, 16 (27.6%) will refer the patient to an Ophthalmologist while eight (13.8%) will refer the patient to a medical personnel/physician. Table 3 shows the action taken by respondents when they observe diabetic retinopathy in a patient.

Table 3: Action taken by respondents when diabetic retinopathy is observed

Response	Frequency (%)	Cumulative %
Counsel patient	4 (6.9)	6.9
Counsel patient, initiate treatment and follow up	1 (1.7)	8.6
Counsel patient, initiate treatment and follow up	1 (1.7)	10.3
Counsel patient and refer to primary care physician	10 (17.2)	27.6
Counsel patient, refer to primary care physician	5 (8.6)	36.2
Counsel patient and refer to ophthalmologist	2 (3.4)	39.7
Initiate treatment and follow-up	2 (3.4)	43.1
Treatment and follow up and refer to primary care	3 (5.2)	48.3
Refer to primary care physician	8 (13.8)	62.1
Refer to primary care physician and refer to	5 (8.6)	70.7
Refer to an ophthalmologist	16 (27.6)	98.3
No response	1 (1.7)	100.0
Total	58 (100.0)	

With respect to the stage of diabetic retinopathy that will warrant a referral, 42 (72.4%) of the respondents will refer the patient at any stage when the diagnosis was made while five (8.6%) will only refer the patient if there is no improvement in the condition presumably after follow-up care. Seven (12.1%) and four (6.9%) will refer

patients at the pre-proliferative and proliferative stage of diabetic retinopathy respectively.



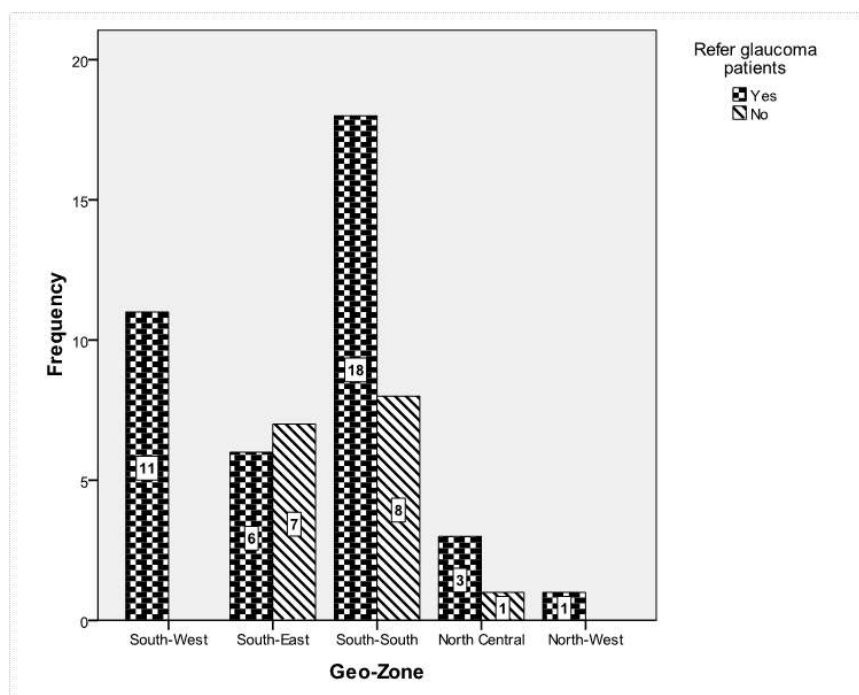


Figure 4 shows the referral patterns for diabetic retinopathy with respect to geo-political zones.

Table 4: Patterns of diabetic referral with respect to geo-political zones

Zone	Refer diabetic retinopathy patients	
	Yes (%)	No (%)
South-West	10 (20.0)	0 (0.0)
South-East	12 (24.0)	1 (25.0)
South-South	24 (48.0)	2 (50.0)
North-Central	3 (6.0)	1 (25.0)
North-West	1 (2.0)	0 (0.0)
Total	50 (100.0)	4 (100.0)

Females are more likely to refer diabetic retinopathy patients than males (OR = 3.682, 95% CI = 0.357 - 37.922). Similarly, Optometrists trained in Abia State University are more likely to refer diabetic retinopathy patients than those trained in University of Benin (OR = 1.722, 95% CI = 0.223 - 13.301).

A further analysis of the interaction of gender with referral pattern showed that both males (OR = 3.451) and females (OR = 8.591) are more likely to refer patients with diabetic retinopathy than patients diagnosed with glaucoma.

Discussion

More often than not primary care providers refer patients to other health care providers when further care is indicated. This system of referral is intended to afford the patient the best care possible. Optometrists as primary eye care providers and given the limitation imposed on their scope of practice are statutorily under obligation to refer patients to the Ophthalmologists or other healthcare providers when such referral is indicated.

More than 70% of respondents claim to refer glaucoma patients to an Ophthalmologist with the majority of them initiating treatment before referral while 28% will continue to manage the patients in their facility. We could not determine if these 28% do so independently or in co-management with Ophthalmologists.

Increasingly, the concern to address the burden of blindness from glaucoma has necessitated the call for non-medical healthcare professionals to play an active role in glaucoma management⁴. Optometrists are well suited to play this role since they possess the fundamental skills required to examine glaucoma patients⁵. Studies⁵⁻⁸ have shown a considerable agreement between Optometrists and Ophthalmologists in assessment of glaucoma patients. Notwithstanding this evidence, a prompt referral system of glaucoma patients for Ophthalmologic consult is suggested as the patient may require an initial surgical intervention. To this end it is believed that good communication between the referring Optometrists and the Ophthalmologists would enhance the referral system. Thus, Classe & Alexander⁹ have proposed a protocol for co-management of certain conditions including cataract. They believed that since schemes of co-management exist, having a written protocol will facilitate communication between Optometrists and

Ophthalmologists and ultimately enhance patient care. Less than half of respondents in the South-East geo-political zone refer glaucoma patients. There is also the finding that respondents trained in Abia State University (in the South-East zone) are less likely to refer glaucoma patients. From these two findings, we can only infer that perhaps it has to do with the curriculum. It is therefore necessary to emphasize the need for prompt referral in the curriculum of Optometry training.

Studies have shown that referral for glaucoma was the second most common reason for Optometrists' referral to Ophthalmologists¹⁰⁻¹³. Weed¹⁰ further revealed that in those referred for glaucoma, 68% were actually diagnosed of glaucoma or were scheduled for a follow-up assessment in order to ascertain the diagnosis of glaucoma by the Ophthalmologists. Furthermore, there was more concurrence of referral reason with the clinical diagnosis made by Optometrists compared to general practitioners¹¹. In the present study, 87.9% of respondents based their diagnosis of glaucoma on the triad of raised IOP, C/D ratio and characteristic visual field defect. This has a tendency to improve on the validity of the referrals thus reducing referral of false positive patients. This is critical because it has been reported that despite more concurrence between Optometrists' and Ophthalmologists' diagnosis of glaucoma relative to general practitioners' diagnosis, optometrists in the UK referred more false positive patients for glaucoma than did general practitioners¹¹. Although 44.8% of respondents use Schiottz tonometer to assess IOP, the tendency to misclassify patients based only on IOP reading obtained using the Schiottz tonometer can be obviated by the fact that IOP is not the single criterion for diagnosing glaucoma amongst the respondents. This is further supported by the fact that 75.9% of the respondent performs



VFT for their patients. This is of more significance giving the present knowledge that raised IOP is not a cause of, but a risk factor for glaucoma. Given the irreversible damage caused by glaucoma, the need for surgical intervention when indicated and the potential for sight loss when appropriate care is delayed, it is imperative that all glaucoma patients receives Ophthalmologic consult to determine the best course of management.

Referral pattern for diabetic retinopathy

Diabetic retinopathy is one of the principal causes of blindness and visual impairment in Nigeria¹⁴. The incidence of vision loss or blindness due to ocular complications of diabetes raises sufficient public health concern, with diabetic retinopathy alone responsible for 12,000 to 24,000 new cases of blindness yearly in the United States¹⁵. Early detection and prompt management are central to dealing with visual impairment due to diabetic retinopathy. At the nexus of this is appropriate and efficient referral of patients with diabetes and early signs of ocular manifestation of diabetes. In the present study, all respondents but four will refer patients when there are signs suggestive of diabetic retinopathy. Majority of the respondents would refer the patients at any stage at which a diagnosis is made. Given that management of diabetic retinopathy falls outside the scope of practice of optometrists in Nigeria, it is advocated that all patients presenting with diabetes and diabetic retinopathy be promptly referred for Ophthalmologic assessment and prompt treatment.

That the odds favored the referral of diabetic retinopathy than glaucoma may relate to the fact that while some Optometrists may initiate management of glaucoma, this is not the case with diabetic retinopathy. Diabetic retinopathy may present more challenge in making a diagnosis. Management of diabetic

eye disease also requires ongoing diabetic control. This may account for the reason why some 13.8% of respondents will refer patients presenting with signs suggestive of diabetes to medical personnel/physicians including another 17.2% who will do the same after counseling the patients on the cause and course of the disease. Studies amongst South African Optometrists indicated that there was no consistency and standardized referral protocol for referring patients with diabetic retinopathy¹⁶. Majority of the respondents in the South African study were not aware of any national or international guidelines for the management of patients with diabetic retinopathy¹⁶. Almost all respondents indicated that they provide patient education on the cause and course of diabetic retinopathy. This is important because it has been reported that knowledge of ocular complications from diabetes mellitus is low among diabetic patients¹⁷.

We can conclude from our findings that optometrists in Nigeria generally refer patients diagnosed of glaucoma and diabetic retinopathy to other care givers including ophthalmologists. However prompt referral is highly advocated.

There is need for caution in using the conclusions from this study. This is because of the inherent limitations associated with questionnaire studies. Moreover, the few respondents may impose further limitations. Notwithstanding these, the findings represent a baseline for further investigation into the referral practice of Optometrists in Nigeria. We recommend further investigation into factors influencing referral practices, issues of appropriate referral, communication between the referring Optometrists and the Ophthalmologists receiving the referrals. These issues will enhance the referral system and ultimately benefit the patients.



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