

Factors Affecting Knowledge of Ophthalmic Diseases among Non-Ophthalmic Doctors

¹Obiajulu C Echedom, ¹Nkiruka N.M Okoloagu, ¹Ezekiel N EKweremadu, ²Stella N Onwubiko, ²Rich E Umeh, ²Ernest N Onwasigwe

¹Department of Ophthalmology, College of Medicine, Enugu State University of Science and Technology Enugu, Nigeria.

²Department of Ophthalmology, University of Nigeria Teaching Hospital, Enugu, Nigeria.

Corresponding Author: Nkiruka N.M Okoloagu, Department of Ophthalmology, College of Medicine, Enugu State University of Science and Technology Enugu, Nigeria.

Citation this Article: Obiajulu C Echedom, Nkiruka N.M Okoloagu, Ezekiel N EKweremadu, Stella N Onwubiko, Rich E Umeh, Ernest N Onwasigwe, “Factors Affecting Knowledge of Ophthalmic Diseases among Non-Ophthalmic Doctors”, IJMSIR- October - 2020, Vol – 5, Issue - 5, P. No. 136 – 151.

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Introduction: Medical education has evolved over the years to accommodate the ever increasing body of knowledge and disciplines. However, duration of training of medical students has not changed for over a century. This will warrant that lesser time will be allocated to each discipline both in the classroom and during clinical demonstration to accommodate this epistemic expansion. The expected outcome may be little of everything and much of nothing which can manifest as deficiencies in knowledge and practice patterns for the young intern.

Aim: To evaluate the factors that affect knowledge of non-ophthalmic medical doctors on prevalent blinding ophthalmic diseases in the metropolitan city of Enugu.

Materials and method: A total of three-hundred-and-ninety-one (391), non-ophthalmic medical doctors took part in the study. Majority of the doctors in the metropolis work in tertiary health institutions and they were recruited by a simple random process while all the non-ophthalmic doctors practicing in the suburbs were

enlisted considering that they were few in number. The participants were examined through a pre-tested questionnaire on the definition, symptoms, causes and treatment of cataract, glaucoma, and refractive error.

Results: The respondents demonstrated good knowledge of cataract, glaucoma and refractive error, having the following mean total scores: 75.4%, 51.9% and 72.3% respectively. However there were gaps in the causes and treatment options of some of these diseases.

Place of work was the only statistically significant variable in the factors that affects their knowledge. The respondents in the tertiary institutions obtained better scores in the knowledge of cataract and glaucoma than their colleagues in the primary and secondary centres.

Conclusion: Despite that the respondents had good general awareness of prevalent blinding conditions like cataract, glaucoma and refractive errors, the knowledge appeared to lack depth and was also location-dependent.

Introduction

It is estimated that 2-5% of all consultations in general practice are for eye problems, worldwide.^{1,2} Ophthalmic diseases resulting in diminished vision are associated with increase in injury, family stress, physician visits, depression, hospitalizations and mortality. The United States of America (USA) government in 2003 spent approximately \$67.6 billion for visual disorders.³ This study noted that blindness, visual impairment and eye diseases were on the increase.

A lot of reservations have been expressed by researchers concerning the capability of general medical practitioners to maintain sufficient skills in the examination and treatment of vision problems. They maintain that the time spent in teaching vision related clinical skills in the schools has been on the decline.^{3,4}

In a study in south London, 68% of the General Practitioners (GPs) admitted to having “uncertainties about eyes” while 10% affirmed the statement “eyes scare me stiff.”⁵ According to some studies which determined diagnostic accuracy of referrals to ophthalmic clinics,^{6,7} ability to detect asymptomatic eye disease,⁸ attitude and practices,^{9,10} GPs performed poorly. Awareness and knowledge of prevalent eye diseases, among general practitioners is very important. They play an important role as they serve as the first point of contact for patients before referrals are made. Details provided by a simple ophthalmic examination are helpful to ophthalmologists when allocating clinic appointments of an appropriate degree of urgency. Unfortunately such details are often lacking in referral letters.¹¹

A good knowledge of prevalent eye diseases amongst non-ophthalmic medical doctors is important in promoting preventive ophthalmic care. In the year 2000, Nigeria joined the world to support the global

initiative-VISION 2020 ‘the Right to Sight’, by signing the declaration of support. It is an initiative to eliminate the causes of avoidable blindness by the year 2020, as avoidable blindness accounts for over 80% causes of blindness in Nigeria.¹² According to the Nigeria National Blindness and Visual Impairment Survey 2005-2007; cataract was the commonest cause of severe visual impairment and blindness being responsible for 45.3% and 43.0% respectively. Glaucoma was the second commonest cause of blindness, 16.7%. The prevalence of blindness in the South East geo-political zone was 4.63% ranking third among the six geopolitical zones.¹²

Cataract is the leading cause of blindness worldwide, accounting for half of the world’s blind population.¹³ Cataract blindness poses one of the greatest public health challenges of the twenty first century.¹⁴ According to the WHO, an estimated 20 million people worldwide are blind from bilateral cataracts.^{15,16} It is estimated that over 90% of the world’s visually impaired live in developing countries.¹⁶ In these countries, blindness is associated with considerable disability and excess mortality, resulting in large economic and social consequences.¹⁶

Glaucoma is the second leading causes of blindness after cataract, and is the major cause of irreversible blindness.¹⁷ Glaucoma management represents one of the most important public health problems facing eye care delivery world-wide and is responsible for the third commonest reason to visit an ophthalmologist in the USA.¹⁸ Approximately 68 million people worldwide have glaucoma in some form, with 6.7 million bilaterally blind from the disease.¹⁸ Almost 2.5 million people in the US alone are afflicted with open angle glaucoma with about half being unaware they have the disease.¹⁸

Uncorrected refractive errors are a major cause of blindness and low vision, about 8 million people are blind, 145 million have low vision because of lack of adequate refractive correction.¹⁹ Uncorrected refractive errors were the commonest cause of mild and moderate visual impairment, 77.9% and 57.1% respectively in Nigeria (rates are for those 40years or above).¹²

Approximately three quarters of Americans over the age of 40 have refractive errors greater than 0.50D.^{20,21} About 150 million Americans currently use some form of eyewear to correct refractive errors, and of this number 36 million use contact lenses.²² It is estimated that over 2.3 million patients in the US underwent refractive surgery from 1995 to 2000.²² The most widely studied refractive error is myopia, its prevalence in the US population was estimated at 25% in the early seventies,²² where as in Nigeria hypermetropia is more prevalent¹². It is therefore important for GPs to know about these three causes of ocular disease.

Justification

Non-Ophthalmic medical doctors are more often than not the first to be consulted by patients with visual symptoms in health facilities due to the fact that nearly all ophthalmologists work in tertiary hospital setting located in major cities. Studies have shown that patients present quite late to the ophthalmologist, when their vision may have been markedly impaired.¹⁴ With respect to glaucoma, where the vision is irreversibly lost, it can be depressing when the patients find out something could have been done earlier to salvage their sight. Cataract is the commonest cause of reversible blindness globally, and it is treatable by surgery.¹⁴ Uncorrected refractive errors are the commonest causes of mild and moderate visual impairment in Nigeria¹². The number of blind people would increase as the

elderly population is expected to increase by the year 2020.¹⁸

It has therefore become crucial to investigate the ability of non-ophthalmic medical doctors to tackle this challenge, especially their ability to identify the pathologies, treat minor ones and make urgent referrals to the Ophthalmologists. This study therefore sought to assess the level of knowledge of the non-ophthalmic doctors on the prevalent eyes diseases causing avoidable blindness such as cataract, glaucoma and refractive errors.

Materials and Methods

Study Design: This was a descriptive, cross-sectional study carried out between September and December, 2011.

Study Area: This study was done in Enugu metropolis and the surrounding areas. Enugu metropolis is made up of three local government areas, namely Enugu North, Enugu South and Enugu East. The environs include the adjoining three local government areas, which are Nkanu West, Nkanu East and Udi. These six local government areas constitute the study area.

Sample Population: Non-ophthalmic medical doctors working in the primary, secondary and tertiary health centres in the six local government areas.

Inclusion Criteria: All non- ophthalmic doctors working in the six local government areas who were willing to participate in the study.

Exclusion Criteria: Ophthalmic doctors (consultants, residents and medical officers working in ophthalmology departments) in the six local government areas.

Ethical Consideration

Ethical clearance was obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu. The

study was done according to the regulations regarding confidentiality of human subjects with respect to the 1994 Helsinki declaration. Informed written consent was obtained from the respondents.

Questionnaire

The questionnaire was semi structured, and contained both closed and open ended questions. It was divided into two sections namely, socio-demography and knowledge of prevalent eye diseases. Areas covered include definition, symptoms, etiology, and treatment of three prevalent eye diseases namely cataract, glaucoma, and refractive error, knowledge of asymptomatic presentation of glaucoma was determined. Knowledge of genetics and senility as risk factors of cataract and glaucoma were also determined. The use of laser treatment in glaucoma was also sought out for.

The scoring system was as follows: 0% to 49% poor; 50% and above good. Years of practice post-graduation, sex, age and place of work were assessed for any significant associations.

Sample Size And Sampling

The calculated minimal sample size of 391 was based on 50% prevalence of non availability of prevalence study for a population greater than 10,000 and an error band of 20%. Simple random sampling was used to select the participants' tertiary institution while all the doctors in primary and secondary health centres were all enrolled in the study because of mal distribution of doctors in Enugu state.²³

Study Procedure

Six registrars from the Ophthalmology Department, University of Nigeria Teaching Hospital Ituku/Ozalla were recruited and trained as research assistants for a day. They took part in the administration of the questionnaire. The questionnaire

was pretested on medical doctors in Umuleri general hospital in Anambra state and amended for clarity of content. The pretest results were excluded from the final data. The interviewers were divided in groups of two; they contacted, visited, interviewed, obtained written informed consent and administered the questionnaire to the respondents.

Study Definition

Good knowledge of cataract is defined as an average score of 50% or above in rightly defining cataract as opacity of the crystalline lens; correctly listing painless progressive dimness of vision as a symptom of cataract; in marking the causes of cataract as senility, trauma, diabetes mellitus, congenital and genetic; in rightly marking surgery as the treatment of choice; while poor knowledge of cataract is a score of less than 50% in the definition, symptom, causes and treatment of cataract.

Good knowledge of glaucoma is defined as an average score of 50% or above in rightly defining glaucoma as being primarily a disease of the optic nerve; in correctly marking painless progressive dimness of vision and bumping into objects by the side as symptoms of glaucoma; marking genetics, trauma and senility as major risk factors for glaucoma; in ticking medical and surgical as well as laser as treatment modalities of glaucoma; while poor knowledge of glaucoma is a score of less than 50%.

Good knowledge of refractive error entails obtaining a score of 50% or above in correctly defining refractive error as inability of the optical system to register a clear image on the retina, marking blurring of vision, tearing and double vision as symptoms of refractive error correctly, marking myopia, hypermetropia and astigmatism as types of refractive error; treatment of refractive error as spectacle correction, contact lenses

and surgery. Poor knowledge of refractive errors is scoring less than 50%.

Data Collection And Analysis

Data entry and cleaning were done. The data were analyzed with Statistical Package for Social Sciences (SPSS) version 16.0. Chi-square(χ^2) was used for class comparisons while student T-test was used to compare means. A $P < 0.05$ was considered statistically significant.

Table 1: Age and sex distribution of respondents. N = 365

Variables	Frequency (f)	Percentage (%)
Age group (years):		
20 – 30	93	23.8
31 – 40	176	45.0
41 – 50	71	18.2
≥ 50	25	6.4
Sex:		
Male	313	80.1
Female	78	19.9

* 26 of the respondents who took part in the study did not indicate their ages.

Table 2. Distribution of year of graduation and place of work of respondents. N = 391.

Variables	Frequency(f)	Percentage (%)
Number of years post graduation		
1 – 10	268	68.5
> 10	123	31.5
Place of work		
Primary centre	21	5.4
Secondary centre	22	5.6
Tertiary centre	348	89.0

Most of the doctors have practiced up to 10 years post graduation and majority of them in the tertiary centre as shown in Table 2.

Results

A total of 391 non-ophthalmic doctors took part in the survey. With varying degree of response in the parameters, only 365 duly filled their ages. Of all the respondents 176 (45.0%) were aged between 31 and 40 years with a mean age of 35.9 ± 7.7 years. Majority of the participants 244 (62.4%) were married, and all the doctors were Christians except one who was a Muslim. Majority of the respondents were males (89.1%).

Table 3: Correct knowledge of cataract N=391

Correct knowledge	Number of respondents (f)	Percentage score (%)
Definition of cataract:		
Opacity of the crystalline lens	313	80.1
Symptoms of cataract:		
Painless progressive dimness of Vision	325	83.1
Causes of cataract:		
Diabetes mellitus	350	89.5
Congenital	311	79.5
Senility	289	73.9
Trauma	288	73.7
Genetic	117	29.9
Treatment of cataract:		
Surgical	365	93.4
Mean percentage score		75.4%

Table 3: shows that majority of the respondents had good knowledge of the various aspects of cataract except the genetic cause (29.9%).

Table 4: Correct knowledge of glaucoma, N=391.

Variables	Respondents (f)	Percentage score (%)
Definition of glaucoma:		
Glaucoma is primarily a disease of the optic nerve	186	47.6
Symptoms of glaucoma:		
Bumping into objects by the side	181	46.3
Painless progressive dimness of vision	165	42.2
Major risk factors for glaucoma:		

Trauma	205	52.4
Genetic	199	50.9
Senility	154	39.4
Treatment of glaucoma:		
Medical/surgical	336	85.9
Laser	106	27.1
Mean percentage score		51.9

Table 4: shows that the respondents had a good knowledge of glaucoma as shown by the mean score, but performed poorly in some aspects of their knowledge.

Table 5: Correct knowledge of refractive error. N=391

Variables	Respondents (f)	Percentage score (%)
Definition of refractive error:		
Inability of the optical system to register a clear image on the retina	338	86.4
Symptoms of refractive error:		
Blurring of vision	341	87.2
Double vision	274	70.1
Tearing	189	48.3
Types of refractive error:		
Myopia	380	97.2
Hypermetropia	367	93.9
Astigmatism	319	81.6
Treatment of refractive error:		
Spectacle correction	370	94.6
Contact lenses	302	77.2
Surgery	103	26.3
Mean percentage score		72.3

Table 5: demonstrated good knowledge of refractive error except in the use of surgery as a treatment option.

Table 6: a cross tabulation of Knowledge of cataract with age, sex, post-graduation years and place of work of the respondents, N = 391.

	Good Knowledge (%)	Poor knowledge (%)	X (P- value)	Odd Ratio(OR)
Age				
< 40 years	269(86.2)	43(13.8)	1.67(0.19)	1.94
≥40 years	73(92.4)	6 (7.6)		
Sex				
Male	272(86.9)	41(13.1)	0.24(0.62)	1.32
Female	70(89.7)	8(10.3)		
Years post –graduation				
1-10 years	236(88.1)	32(11.9)	0.13(0.72)	0.84
>10 years	106(86.2)	17(13.8)		
Place of work				
Primary/Secondary	31(72.1)	12(27.9)	8.90(0.003)*	3.25
Tertiary	311(89.4)	37(10.6)		

*significant P<0.05. Table 8, respondents working at the tertiary centres are more knowledgeable about cataract than their colleagues in the primary and secondary health centres. P value statistically significant (0.003).

Table 7: A cross tabulation of knowledge of glaucoma according with age, sex, post-graduation years and place of work of the respondents, N = 391.

	Good Knowledge (%)	Poor knowledge (%)	X (P value)	Odd Ratio(OR)
Age				
< 40 years	224(71.8)	88(28.2)	1.14(0.29)	1.43
≥40 years	62(78.5)	17(21.5)		
Sex				

Male	232(74.1)	81(25.9)	0.53(0.46)	0.78
Female	54(69.2)	24(30.8)		

Years

post –graduation

1-10 years	198(73.9)	70(26.1)	0.13(0.72)	0.88
>10 years	88(71.5)	35(28.5)		

Place of work

Primary/Secondary	25(58.1)	18(41.9)	4.71(0.03)*	2.16
Tertiary	261(75.0)	87(25.0)		

*significant P<0.05. Table 7 shows that respondents from tertiary centres are more knowledgeable about glaucoma than their colleagues in primary and secondary centres (P=0.03).

Table 8. Knowledge of refractive error according to age, sex, post-graduation years and place of work of the respondents, N= 391.

	Good Knowledge (%)	Poor knowledge (%)	X (P value)	Odd Ratio (OR)
Age				
< 40 years	286(91.7)	26(8.3)	0.99(0.91)	1.11
≥40 years	73(92.4)	6(7.6)		
Sex				
Male	288(92.0)	25(8.0)	0.13(0.85)	0.88
Female	71(91.0)	7(9.0)		
Years				
post –graduation				
1-10 years	244(91.0)	24(9.0)	0.38(0.53)	1.14
>10 years	115(93.5)	8(6.5)		
Place of work				
Primary/Secondary	38(88.4)	5(11.6)	0.33(0.56)	1.56

Tertiary	321(92.2)	27(7.8)
----------	-----------	---------

Tab 8 shows that those 40 years or above, males, those more than 10 years post graduation and respondents from tertiary institutions had better knowledge of refractive error but not statistically significant ($p > 0.005$)

Discussion

This study was set to evaluate how much of the common, prevalent blinding eye conditions are known to non-ophthalmic medical doctors in the South East of Nigeria. The mean age of the participants was 35.9 years which is less than the Italian study (44.7years).²⁴ The respondents in the 31-40 years age group had the highest frequency of 176 (45%) which is similar with the Lagos study.²⁵ A possible explanation could be that this age group is very active among the work force of a society. The male preponderance in this study was 4:1, while the Lagos study²⁵ was 3:1 ratio. Male preponderance seen in this study can be attributed to more male doctors in Enugu which is a function of sex-differential enrolments into medical schools in the study area. The study also revealed that majority (68.5%) of the respondents had only 1 to 10 years post graduation experience as well as employed in tertiary hospitals. This is likely as a result of residency training offered by these tertiary hospitals that attracts young doctors.

The respondents had good knowledge of cataract, glaucoma and refractive error, having the following mean total scores: 75.4%, 51.9% and 72.3% respectively (Tables 3-5). This finding was similar to the South Africa²⁶ Oman²⁷, and Enugu⁴ studies. However this study contrasts with some other studies done in Canada^{28,29}, and Brisbane³⁰. Studies have shown that undergraduate teaching of ophthalmology both in time and content have often been insufficient to allow students to master what is clearly a difficult subject. There is a lack of opportunity to gain

confidence and knowledge with complex skills such as direct ophthalmoscopy or slit lamp biomicroscopy.^{27,31}

On cataract, respondents had good general knowledge. However, the role of genetics in the etiology of cataract was poor (29.9%). A study done in South Africa showed that ophthalmology is a neglected subject in the undergraduate curriculum.²⁶ A similar view was also noted by a study in USA, where it was observed that up to 70% of medical schools do not require rotation through ophthalmology for graduation.³² These are pointers to advocate for effective undergraduate training in Nigeria.

In terms of glaucoma knowledge, only 47.6% of the respondents believed it to be a primarily a disease of the optic nerve. Majority of the respondents had well below 53.0% in terms of etiologic risk factors. In terms of treatment options, the knowledge that use of laser as a treatment option was remarkably poor (27.1%) and this is despite the fact that glaucoma is the leading cause of irreversible blindness in the world. Similar findings have been observed in Devon in United Kingdom (UK).⁶ This UK study revealed that most general practitioners did not feel confident in ophthalmology in general. Low level of knowledge and confidence was noted especially in terms of posterior segment lesions like glaucoma, diabetic retinopathy and retinal detachment. However, most non ophthalmic medical doctors expressed willingness to participate in continuing medical education in ophthalmology for better patient care.⁶

The knowledge of refractive error is good in terms of symptoms, types and treatment options, but the

knowledge of surgery as a treatment option for refractive error is poor (26.3%).

Cross-tabulation analysis in this study (Tables 6-8), which compared the results with respect to age, sex, years post-graduation and place of work, revealed that respondents in the tertiary hospitals were more knowledgeable in cataract and glaucoma than their colleagues in the primary and secondary health facilities. This might be conditioned by the fact that various levels of interaction occur between ophthalmic and non-ophthalmic doctors in the tertiary hospital setting. Despite the wide disparity in the gender ratio, there was no significant difference in the knowledge of cataract, glaucoma and refractive error, between the sexes in this study. This suggests that both sexes were equally exposed knowledge-wise during their undergraduate training. Years post-graduation did not prove to be a predictive factor for knowledge in this study (Table 2).

Limitations

- Most of the questions were close-ended, as such in-depth information could not be acquired from the respondents.
- Courtesy bias might not be ruled out as the respondents might tell the researcher what he wants to hear thereby influencing the outcome and conclusions.
- Selection bias might not be entirely excluded as the sample studied might not be representative of the overall population due to imprecise sampling techniques.

Conclusion and Recommendations

In view of the knowledge gaps observed in this study especially with respect to glaucoma, it has become pertinent that medical school curriculum should be reviewed to improve the clinical knowledge of doctors

on prevalent eye diseases, along the lines of longer exposures and postings in ophthalmology and emphasis on clinical skill acquisition. Also, retraining of doctors as part of continuing education will improve the ability of non-ophthalmic doctors to manage patients with ocular complaints, including prompt referral, a competence that can be sight saving.

References

1. Dart JK. Eye disease at a Community health centre. *BMJ* 1986; 293:1477-1480.
2. McDonnell PJ. How do general practitioners manage eye disease in the community? *Br J Ophthalmol* 1988; 72: 733-736.
3. Coleman AL, Gergana K, Wallace SP, Michael P, Ortega AN, Giarconi J. Visual functioning of individuals and communities. *Clinical medicine: Geriatrics*. 2008; 2:13-20.
4. Eze BI, Oguego NC, Uche JN, Mbah CN. Assessing the knowledge and skills in clinical ophthalmology of medical interns: survey results from Enugu South-Eastern Nigeria. <http://www.meajo.org>.IP:41 203.64.128.
5. Wilson A, Coll JR. The red eye: a general practice survey. *Gen Pract*.1987; 37:62-4.
6. Harrison RJ, Wild JM, Hobley AJ. Referral patterns to an ophthalmic outpatient clinic by general practitioners and ophthalmic opticians and the role of these professionals in screening for ocular disease. *BMJ*. 1988; 297: 1162-7.
7. Brittain GP, Austin DJ. A prospective study to determine sources and diagnostic accuracy of glaucoma referrals. *Health Trends*. 1988; 20:43-4.
8. MacKean JM, Elkington AR. Referral routes to hospital of patients with chronic open angle glaucoma. *BMJ* 1982; 285:1093-5.

9. Lavin MJ, Rose GE. Use of steroid drops in general practice. *BMJ*. 1986; 292: 1448-50.
10. Claoue CM, Stevenson KE. Incidence of inappropriate treatment of herpes simplex keratitis with steroids. *BMJ*. 1986; 292:1450-1.
11. Jones NP, Lloyd IC, Kwartz J. General practitioner referrals to an eye hospital: a standard referral letter. *R Soc Med*. 1990; 83:770-2.
12. Abdul MM, Sivasubramanians NG, Gilbert C, Abubakar T, Ezelum C, Rabi MM. Nigerian National Blindness and Visual Impairment Study group. Causes of blindness and visual impairment in Nigeria: The Nigerian blindness and visual impairment survey. *Invest ophthalmolvissci* 2009; 50(9):4114-4120.
13. Thylefors B. The World Health Organisation's programme for the prevention of blindness. *IntOphthalmol*. 1990; 14:211-219.
14. Geoffery T, Chen M, Espander L. *Current opinion in ophthalmol*. 2008; 19:55-59.
15. Resnikoff S, Parcolini D, Etya'ale D. Global data on visual impairment in the year 2002. *Bull World Health Organ*. 2004; 82: 844-851.
16. Frick KD, Foster A. The magnitude and cost of global blindness: an increasing problem that can be alleviated. *Am J Ophthalmol*. 2003; 135:471-476.
17. Sastry SM, Chyang YP, Javitt JC. Practice patterns of the office-based ophthalmologist. *Ophthalmic surg*. 1994; 25: 76-81.
18. Quigley HA. Number of people with glaucoma world-wide. *Br J Ophthalmol*. 1996; 80: 389-393
19. Resnikoff F, Donatella P, Silvio PM. Global magnitude of visual impairment caused by uncorrected refractive errors in 2004. *Bull World Health Organ*. 2008; 86:63-70.
20. Wang Q, Klein BE, Klein R, Moss SE. Refractive status in the Beaver Dam Eye Study. *Invest Ophthalmol Vis Sci*. 1994; 35:4344-4347.
21. Health Products Research, Inc., Vision Information Services-The Contact Lens Report.2002.
22. Sperduto RD, Roberts J, Rowland M. Prevalence of myopia in the United States. *ArchOphthalmol*. 1983; 101:405-407.
23. Eze BI, Maduka-Okafor FC. An assessment of the eye care workforce in Enugu State, South-eastern Nigeria. *Human Resources for Health*.2009, 7:38.
24. Daghigh MM, Ciardullo AV, Cadioli T, Delvecchio C, Menna A, Voci C, et al.GPs' satisfaction with the doctor-patient encounter: findings from a community basedsurvey. *Family Practice*. 2003; 20:283-288.
25. Akinsola FB, Alimi HL Oyele TO and Majekodumi AA. Knowledge, Attitude and Practice of Eye Health Care amongst doctors in Lagos. *Nigerian Quaterly Journal of Hospital Medicine*. 2004. Vol. 14,1;12:31-34.
26. Van Zyl LM, Fernandes N, Rogers G, Du Toit N. Primary health eye care knowledge among general practitioners working in the Cape Town metropoleS *AfrFamPract*. 2011; 53(1):52-55.
27. Khanderkar R, Shar S, Al lawatti J. Retinal examination of diabetic patients: knowledge, attitude and practices of physicians. *Eastern Mediterrenian Health Journal*. 2008; 14:4.
28. Noble J, Somal K, Gill HS, Lam WC. An analysis of under-graduate ophthalmology training in Canada. *Can J Ophthalmol*. 2009; 4: 513-518.
29. Lippa LM, Boker J, Duke A, Amin A. A novel 3-year longitudinal pilot study of medical students' acquisition and retention of screening eye

- examination skills. *Ophthalmology*. 2006; 113: 133–139.
30. Jackson C, Hirst L. Brisbane GPs' perceptions of screening for primary open angle glaucoma. *Aust N Z J Ophthalmol*. 1995 Aug; 23(3):179–81.
31. Pierscionek TJ, Moore JE, Pierscionek BK. Referrals to ophthalmology: optometric and general practice comparison. *Ophthalmic Physiol Opt*. 2009; Jan; 29(1):32–40.
32. National Eye Institute, National Eye Health Education Program. Primary care physicians and eye health: Results of a National web-based survey. Available at: <http://www.nei.nih.gov/nehep/research/Manuscript.pdf>. Accessed: September 13, 2011.

Questionnaire on Factors Affecting Knowledge Of Ophthalmic Diseases Among Non-Ophthalmic Doctors In Enugu And Environs

Section 1

Socio-Demographic Information

First, I would like to ask you some questions about yourself and your household. Instruction: Tick appropriate codes

1. Record sex of respondent as observed.

- a) Male b) Female

2. How old are you

Age in years

3. What year did you graduate?

- a) Less than five years b) Five to ten years

c) Eleven to twenty years

d) More than twenty years

4. Are you in general practice?

- a) Yes b) No

5. Are you a specialist/consultant? a) Yes No

6. If yes to 5 above, which is your area of specialisation?

.....

7. Are you in the residency program/post graduate program?

- a) Yes No

8. If yes to 7 above, which is your area of specialisation?

.....

9. Place of work a) Primary Health Centre

b) General Hospital c) Tertiary hospital d) Private hospital

10. What is your marital status now?

a) Single b) Married c) Widowed d) Divorced

e) Separated f) others (specify)

11. What is your religion? a) Christian Muslim
c) African Traditional Religion No religion
e) Others

Knowledge of Common Ocular Diseases

Tick/circle the alphabet signifying the appropriate answer, more than one answer may be correct

Cataract

- (1) Cataract is
- a) whitish pupillary reflex
 - b) Opacity of the cornea
 - c) Opacity of the pupil
 - d) Opacity of the crystalline lens
 - e) Others specify.....
- (2) Symptoms of cataract include
- a) Pain
 - b) Dimness of vision
 - c) Painless progressive dimness of vision
 - d) Painful progressive cloudiness of vision
 - e) Others specify.....
- (3) Causes of cataract include
- a) Senility
 - b) Trauma
 - c) Diabetes mellitus
 - d) Congenital
 - e) Genetic
 - f) Other.....
- (4) Treatment of cataract include
- a) Surgical
 - b) Medical
 - c) Medical/surgical
 - d) Couching
 - e) Other.....

Glaucoma

- (5) Glaucoma is primarily a disease of
- a) Iris
 - b) Cornea
 - c) Optic nerve

d) Lens

(6) Symptoms of glaucoma include

- a) Pain
- b) Painless progressive dimness of vision
- c) Painful progressive dimness of vision
- d) Bumping into objects by the side
- e) Other

(7) Causes of glaucoma include

- a) Familial
- b) Genetic
- c) Trauma
- d) Senility
- e) Other

(8) Treatment of glaucoma include

- a) Medical only
- b) Surgical only
- c) Medical/surgical
- d) Laser

Refractive Error

(9) Refractive error results from inability of the optical system to register a clear image on the

- a) Cornea
- b) Aqueous humour
- c) Pupil
- d) Lens
- e) Retina

(10) Some of the symptoms of refractive error include

- a) Blurring of vision
- b) Dimness of vision
- c) Tearing
- d) Double vision

(11) Types of refractive error include

- a) Myopia
- b) Hypermetropia
- c) Astigmatism
- d) Other

(12) Treatment of refractive error include

- a) Spectacle correction
- b) Temporary spectacle correction
- c) Surgery
- d) Contact lenses
- e) Other