

**THE KNOWLEDGE OF GENERAL PRACTITIONERS IN THE VAAL
TRIANGLE CONCERNING COMMON EYE DISEASES**

By

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Declaration

I, **Johannes Tobias de Lange** declare that

(i) The research reported in this dissertation, except where otherwise indicated, is my original work.

This dissertation has not been submitted for any degree or examination at any other university.

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Signed:



Date: 14 July 2017

Dedication

First, to my heavenly Father who without, none of this would have been possible.

To my lovely wife Maria, without her love and support I could not have dreamt to
finish my further studies.

My three boys Jovan, Janko and Wihan, thanks for understanding the time I could
not optimally spend with you during my studies. I promise I will make up for this.

To my Parents Johan and Annetjie for their love and teaching me from day one that
hard work and perseverance will pay off!

Also for my mother-in-law, Mary Anne, my sister Erika and her family, for all their
love and prayers

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Also for Dr. Linda Visser my Head of Department for her input during the study.

I have no financial interests or other contributions to declare.

Overview

General Practitioners (GPs) are often the first clinician to be consulted regarding eye care problems. The incidence of avoidable visual impairment will increase significantly in the future raising concerns that the General Practitioner (GP) will be confronted even more with eye related complaints. Worldwide there is a tendency to decrease the amount of time spent in undergraduate training, in all smaller disciplines. Inadequate undergraduate training seems to leave a void in the knowledge of GPs concerning the management of primary eye care problems.

Having been in Private GP Practice myself for five years and then starting to specialise, I realised that the undergraduate exposure to Ophthalmology is most probably insufficient. During my interaction with colleagues at a GP level, I found that this is a common feeling and that this contributed to uncertainty in treatment of patients with "eye problems".

This study aimed to examine the knowledge of GPs in the Vaal Triangle (Vereeniging, Vanderbijlpark and Sasolburg) regarding common eye diseases and to determine if any deficiencies in their knowledge existed.

The second objective was to determine if a lack of knowledge regarding common eye diseases could be due to insufficient undergraduate training and to determine if a need to revise the curricula of the undergraduate ophthalmic programs of the various Universities exist. For a comprehensive revision of curricula, a complete examination of the contents and training methods should also be undertaken which is not the aim of this study.

An observational descriptive cross-sectional study, utilising purposive sampling, was done by inviting all GPs in private practice in the Vaal Triangle area, registered with the Health Professional Council of South Africa (HPCSA) and the Board of Healthcare Funders (BHF), to participate. A questionnaire consisting of 10 primary care level ophthalmology questions, as well as questions to determine demographics

and other variables, was emailed to each General Practitioner (GP). The questions were completed online by following a link provided in the email that was send. Most of the questions came from a similar study that was conducted in Cape Town by a different author.

The response rate for this research project was 81.4% (79 out of 97 GPs). All eight South African universities with medical schools were represented in the research population. According to the feedback received 56.5% GP's rated eye related complaints as 10% or more of their total workload. Alarminglly 44.3% GPs scored less than 50% in the questionnaire, yet 83% felt that the primary eye care should be done by the GP. The results further indicated that the longer the undergraduate rotation in the field of Ophthalmology, the better the performance is in terms of knowledge regarding primary eye care management. Duration in private practice did not contribute to better knowledge in the identification and management of eye related problems.

Enhancing undergraduate training programmes for primary eye care may result in better clinical management of eye health by GPs.

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Chapter 1

Introduction

General Practitioners (GPs) are often the first clinician to be consulted regarding eye care problems. The incidence of visual impairment will increase significantly in the future raising concerns that the General Practitioner (GP) will be confronted even more with eye related complaints. Worldwide there is a tendency to decrease the amount of time spent in undergraduate training, in all smaller disciplines. Inadequate undergraduate training seems to leave a void in the knowledge of GPs concerning the management of primary eye care problems.

Background and critical literature review

When South Africans were counted for the second time in October 2001, Statistics South Africa reported a population count of 44 819 778 million. According to these findings approximately 2.3 million or five percent of the total population had a disability. The definition of disability in this survey was: "A physical or mental handicap which has lasted for 6 months, or expected to last at least 6 months, which prevents the person from carrying out daily activities independently, or from participating fully in educational, economic or social activities". Visually impaired persons made up the largest disability group, recorded at 1.3% or approximately 600 000 persons.

In 2002, Resnikoff et al,¹ estimated that the number of people with visual impairment was more than 161 million: 37 million were blind and 124 million were reported as having low vision. The clear majority, 10 million people with low vision and 4 million who were blind, were from developing countries. This will include South Africa.

The World Health Organisation (WHO)² estimated that the incidence of avoidable visual impairments will increase significantly over the next few years. In 2006, it was projected that 314 million people globally had impaired vision due to eye diseases or uncorrected refractive errors and 45 million were blind. However, these numbers were projected to increase drastically. To eliminate the incidence of avoidable blindness by 2020, the WHO and the International agency for the prevention of blindness (IAPB) initiated an action plan called “Vision 2020: The Right to Sight”.

It is imperative that effective eye care services be integrated into the primary health-care system, to achieve this goal. This includes the services of GPs in South Africa. Van Biljon³ noted in 1957 that the eye disease incidence in general practice is 5.3% in South Africa. In Britain, the incidence of eye disease is about 3% in General Practice.⁴ Levy⁵ stated that: “Although general practitioners are concerned with the entire body, ocular ailments are inordinately frequent” and Van Zyl et al.⁶ mentioned that a substantial number of patients with common eye problems are seen at primary health care level which includes the offices of GPs. This suggests that medical doctors are often the first to be consulted regarding common eye problems or medical problems leading to eye complications. These problems often include diseases such as diabetes mellitus which is well known for its severe eye complications if not managed promptly and proactively.⁷ The initial diagnosis and management of the GP can be critical to the patient’s ophthalmic outcome.⁸

As per a study conducted by Leslie and Nkombua⁷ in 2012, it was evident that attention should be given to the knowledge and skills of General practitioners since only 36% of General Practitioners conducted an eye examination in patients with diabetes mellitus, while the lack of referrals to the ophthalmologist of only 22% of patients by GPs in the same study also raised concerns. Aside from the lack of sufficient primary eye care knowledge and skills of some GPs, delayed and inappropriate referrals to ophthalmologists have also been noted. Gibson and Roche⁹ reported in 2014 that referrals made by the GP to the ophthalmologist, especially in terms of emergency care, are poor in terms of quality.

This reflects directly on graduate training programmes in South Africa and possibly worldwide. Studies concerning training of medical doctors in Canada,¹⁰ UK,¹¹ Australia,¹² New Zealand¹³ as well as the USA^{14, 15} have indicated that there is a problem of inadequate ophthalmology training and inadequate eye care by primary health care doctors. Insufficient knowledge and skills concerning ophthalmology in the general practice may significantly impact patient care and contribute to poor management of eye care problems.⁹

GP's should have optimal primary care knowledge and skills to be efficient and effective in the management of their patients, to decrease morbidity from eye diseases and therefore aid in achieving the goal of the Vision 2020 initiative.² To accomplish this, appropriate and efficient training of the medical undergraduate is of utmost importance and it could also be addressed by continuing professional development schemes.⁹

Only then the primary eye care providers will be equipped to deliver high quality, safe and effective primary ophthalmic care by being able to recognise the eye condition and refer appropriately with the related urgency.¹⁶

Research question/hypothesis

Do GPs in the Vaal Triangle exhibit sufficient knowledge regarding common eye diseases? If GPs do lack sufficient knowledge to manage common eye diseases, what areas in terms of the management of common eye diseases are insufficient and could this be due to insufficient undergraduate ophthalmic training?

Methodology

The research was planned and documented to ensure repeatability and to ensure that the research question was answered. The quantitative research approach was used for the purpose of this research project. The observational research design was chosen based on the fact that no interventions were done. The research aimed to

obtain descriptive data about the current ophthalmic knowledge of GPs in private practice, indicating that it was also a descriptive cross-sectional design.

With the purpose of assessing the suitability and feasibility of the research instrument, in this case the questionnaire, a pilot study was conducted.¹⁷ Baker¹⁸ suggested that a pilot study can be done to pre-test the research tools before the mail research project commences. This was done with the intention of identifying adjustments deemed necessary by relevant medical personnel. The pilot study involved ten general practitioners not necessary meeting the inclusion criteria as well as three Ophthalmologists completing the questionnaire. Each of these pilot study participants provided feedback regarding the appropriateness of the questions, the ease with which the questionnaire was completed. Feedback was positive and no modifications to the questionnaire were necessary.

Participants for the study were selected through selective sampling. This is a non-probability sampling method that implies that a researcher choose a sample based on particular characteristics of the population to be researched.¹⁹ In the case of this research project it was all GPs registered with the Health Professionals Council of South Africa (HPCSA) and Board of Healthcare Funders (BHF) who had a private practice in the Vaal Triangle.

All ninety-seven GPs in the Vaal Triangle who met the inclusion criteria were included in the study. They were contacted telephonically and invited to participate in the research. An email with a unique secure link to the questionnaire was send to each participant. The questionnaire could only be completed once per provided link.

All the GPs were requested not to refer to textbooks when completing the questionnaire. The first 10 questions were multiple-choice questions formulated to test the primary eye care knowledge of the GPs. Each question had four possible answers of which only one was correct. These questions regarding the knowledge of GPs about primary eye care management were obtained with permission from a

similar research project performed by Van Zyl et al.⁶ The questions covered relevant topics listed by the Royal College of General Practitioners (RCGP) as eye conditions that need to form part of the learning outcomes of for GP training.²⁰ The questions were formulated in a way to create clinical scenarios that a GP would be presented with in general practice and it included a photo of the condition to be managed. The conditions covered in the first part of the questionnaire included the total of the questions answered correctly for each GP and the mean score of these respondents' knowledge was then calculated.

The second part of the questionnaire consisted of self-rating questions as well as questions that focused on the demographic characteristics of the respondents. The respondents had to rate their knowledge for the researcher to determine a mean self-rating score. The researcher also attempted to gain answers from the respondents regarding their need for more training in ophthalmology. Additionally, questions were asked to obtain a better understanding of the undergraduate training, experience and exposure to ophthalmology cases.

Data obtained from the completed questionnaires were entered into the SPSS version 21 (Statistical Packages for the Social Sciences) for analysis. A p-value < 0.05 was considered to be statistically significant. Data analysis was initiated with a check of the data for outliers, missing data, and normality through skewness and kurtosis values that could affect relations between variables. A descriptive statistical analysis of the data (means, standard deviations, ranges, frequencies and percentages, etc.) was conducted. The Kruskal Wallis test and Analysis of variance (ANOVA) were used to identify the differences in ophthalmology knowledge between GPs from different universities, as well as different curricula within each university based on time spend in ophthalmology during undergraduate training.

Summary

Better medical knowledge of eye conditions is not only of importance, but is absolutely necessary. Unfortunate and sometimes serious complications with long term effects arise due to poor eye care management. Many GPs are not always equipped with knowledge or comfortable to conduct the necessary assessments, diagnoses and treatment of primary eye care condition. Van Selm²¹ raised his concerns in 1985 already, by stating that “as a medical student, the doctor was not adequately taught or encouraged to improve his ophthalmological knowledge from better exposure to the subject”. These concerns grew over time and many researchers across the globe attempted to determine where the short fall lies and how this can be overcome. Possible pit falls in our current training curriculum needs to be identified. In achieving this, research might help to improve the quality of healthcare providers being sent out into the world to care for all people across the globe.

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Chapter 2: A submission ready manuscript

Cover Letter

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Summary

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Title

**The knowledge of general practitioners in the Vaal Triangle concerning
common eye diseases.**

Abstract

Background

General Practitioners (GPs) are often the first clinician to be consulted regarding eye care problems. The incidence of visual impairment will increase significantly in the future raising concerns that the General Practitioner (GP) will be confronted even more with eye related complaints. Inadequate undergraduate training could leave a void in the knowledge of GPs concerning the management of primary eye care problems.

Aim

This research aimed to investigate the knowledge of GPs regarding common eye diseases. The secondary objective was to identify if there may be a need to revise the curricula of undergraduate medical training in ophthalmology. For a comprehensive revision of curricula, a complete examination of the contents and training methods should also be undertaken which is not the aim of this study.

Setting

All GPs in private practice in the Vaal Triangle area, which include Vereeniging, Vanderbijlpark and Sasolburg, were invited to take part in the research project.

39 Methods

40 An observational descriptive cross-sectional study was done by utilising selective
41 sampling. A questionnaire consisting of two parts, served as research tool. Part one
42 contained 10 questions to determine the knowledge of the participants regarding
43 primary eye care management and part two entailed questions regarding the
44 participant's demographics and educational background.

45 Results

46 Years' experience as GP and extra non-ophthalmology qualifications did not improve
47 the GPs knowledge on the management of primary eye care conditions. The GPs who
48 spent more time in ophthalmology rotation during undergraduate training, displayed
49 better knowledge of eye care management.

50 Conclusion

51 The knowledge of a GP regarding primary eye care management is most probably
52 shaped during undergraduate studies. Enhancing undergraduate ophthalmology
53 training programmes may result in better eye care management.

54

Introduction

General Practitioners (GPs) are often the first clinician to be consulted regarding eye care problems. The incidence of avoidable visual impairment will increase significantly in the future raising concerns that the General Practitioner (GP) will be confronted even more with eye related complaints.¹ Worldwide there is a tendency to decrease the amount of time spent in undergraduate training, in all smaller disciplines.² Inadequate undergraduate training seems to cause a void in the knowledge of GPs concerning the management of primary eye care problems. *“The decrease in ophthalmology exposure may allow non-ophthalmologists to misdiagnose, mismanage, or not refer patients with potentially vision or life-threatening eye disorders”.*² A need for research regarding undergraduate ophthalmology training and the GPs ability to manage eye care problems effectively and efficiently is therefore evident.

When South Africans were counted for the second time in October 2001, Statistics South Africa³ reported a population count of 44 819 778 million. According to these findings approximately 2.3 million or five percent of the total population had a disability. The definition of disability in this survey was: “A physical or mental handicap which has lasted for 6 months, or expected to last at least 6 months, which prevents the person from carrying out daily activities independently, or from participating fully in educational, economic or social activities”. Visually impaired persons made up the largest disability group, recorded at 1.3% or approximately 600 000 persons.

In 2002, Resnikoff et al,⁴ estimated that the number of people with visual impairment was more than 161 million: 37 million were blind and 124 million were reported as having low vision. The clear majority, 10 million people with low vision and 4 million who were blind, were from developing countries. This will include South Africa.

The World Health Organisation (WHO)¹ estimated that the incidence of avoidable visual impairments will increase significantly over the next few years. In 2006, it was projected that 314 million people globally had impaired vision due to eye diseases or uncorrected refractive errors and 45 million were blind. However, these numbers were projected to increase drastically. To eliminate the incidence of avoidable blindness by 2020, the WHO and the International agency for the prevention of blindness (IAPB) initiated an action plan called “Vision 2020: The Right to Sight”.

It is imperative that effective eye care services be integrated into the primary health-care system, in order to achieve this goal. This includes the services of GPs in South Africa. Van Biljon⁵ noted in 1957 that the eye disease incidence in general practice is 5.3% in South Africa. In Britain, the incidence of eye disease is about 3% in General Practice.⁶ Levy⁷ stated that: “Although general practitioners are concerned with the entire body, ocular ailments are inordinately frequent” and Van Zyl et al.⁸ mentioned that a substantial number of patients with common eye problems are seen at primary health care levels which includes the offices of GPs. This suggests that medical doctors are often the first to be consulted regarding common eye problems or medical problems leading to eye complications. These problems often include diseases such as diabetes mellitus which is well known for its severe eye complications if not managed promptly and proactively.⁹ The initial diagnosis and management of the GP can be critical to the patient’s ophthalmic outcome.¹⁰

As per a study conducted by Leslie and Nkombua⁹ in 2012, it was evident that attention should be given to the knowledge and skills of GPs since only 36% of GPs conducted an eye examination in patients with diabetes mellitus. While the lack of referrals to the ophthalmologist of only 22% of patients by GPs in the same study also raised concerns. Aside from the lack of sufficient primary eye care knowledge and skills of some GPs, delayed and inappropriate referrals to ophthalmologists have also been noted. Gibson

and Roche¹¹ reported in 2014 that referrals made by the GP to the ophthalmologist, especially in terms of emergency care, are poor in terms of quality.

This reflects directly on graduate training programmes in South Africa and possibly worldwide. Studies concerning training of medical doctors in Canada,¹² UK,¹³ Australia,¹⁴ New Zealand¹⁵ as well as the USA^{16, 17} have indicated that there is a problem of inadequate ophthalmology training and inadequate eye care by primary health care doctors. Insufficient knowledge and skills concerning ophthalmology in the general practice may significantly impact patient care and contribute to poor management of eye care problems.¹¹

GP's should have optimal primary care knowledge and skills to be efficient and effective in the management of their patients to decrease eye diseases and therefore aid in achieving the goal of the Vision 2020 initiative.¹ To accomplish this, appropriate and efficient training of the medical undergraduate is of utmost importance and it could also be addressed by continuing professional development schemes.¹¹

Only then the primary eye care providers will be equipped to deliver high quality, safe and effective primary ophthalmic care by being able to recognise the eye condition and refer appropriately with the related urgency.²

123 Main Aim

124 This research was conducted to investigate the knowledge of GPs regarding common
125 eye diseases.

126 Specific Objectives

127 The objectives were:

- 128 • To determine the knowledge of the GPs regarding eye care management in their
129 private practice.
- 130 • To determine if a correlation exist between the knowledge of the GPs and their
131 undergraduate training.

132 **Research methods and design**

133 The research was planned and documented to ensure repeatability and to ensure that
134 the research question was answered.

135 Study design

136 The quantitative research approach was used for the purpose of this research project.
137 The observational research design was chosen based on the fact that no interventions
138 were done. The research aimed to obtain descriptive data about the current ophthalmic
139 knowledge of GPs in private practice, indicating that it was also a descriptive cross-
140 sectional design.

141 Setting

142 All ninety-seven GPs registered with the Health Professionals Council of South Africa
143 (HPCSA) and Board of Healthcare Funders (BHF) who had a private practice in the
144 Vaal Triangle were invited to participate in the research project.

Study population and sampling strategy

Participants for the study was selected through selective sampling. This is a non-probability sampling method that implies that a researcher choose a sample based on particular characteristics of the population to be researched.¹⁸

Data collection

With the purpose of assessing the suitability and feasibility of the research instrument, in this case the questionnaire, a pilot study was conducted.¹⁹ Baker²⁰ suggested that a pilot study can be done to pre-test the research tools before the mail research project commences. This was done with the intention of identifying adjustments deemed necessary by relevant medical personnel. The pilot study involved ten General Practitioners not necessary meeting the inclusion criteria as well as three Ophthalmologists completing the questionnaire. Each of these pilot study participants provided feedback regarding the appropriateness of the questions, the ease with which the questionnaire was completed. Feedback was positive and no modifications to the questionnaire were necessary.

All ninety-seven GPs in the Vaal Triangle who met the inclusion criteria were included in the study. They were contacted telephonically and invited to participate in the research. An email with a unique secure link to the questionnaire was send to each participant. The questionnaire could only be completed once per provided link. Before the questionnaire could be answered the participant had to electronically provide consent to be part of the study. The consent was automatically linked to the unique secure link and recorded on the data only as given. The software keeps record of the given consent but does not allow the completed form to be printed with the answer sheet to keep the answers confidential.

All the GPs were requested not to refer to textbooks when completing the questionnaire. The first 10 questions were multiple-choice questions formulated to test the primary eye care knowledge of the GPs. Each question had four possible answers of which only one was correct. These questions regarding the knowledge of GPs about primary eye care management were obtained with permission from a similar research project performed by Van Zyl et al.⁸ The questions covered relevant topics listed by the Royal College of General Practitioners (RCGP) as eye conditions that need to form part of the learning outcomes of for GP training.²¹ The questions were formulated in a way to create clinical scenarios that a GP would be presented with in general practice and it included a photo of the condition to be managed. The conditions covered in the first part of the questionnaire included the total of the questions answered correctly for each GP and the mean score of these respondents' knowledge was then calculated.

The second part of the questionnaire consisted of self-rating questions as well as questions that focused on the demographic characteristics of the respondents. The respondents had to rate their knowledge for the researcher to determine a mean self-rating score. The researcher also attempted to gain answers from the respondents regarding their need for more training in ophthalmology. Additionally, questions were asked to obtain a better understanding of the undergraduate training, experience and exposure to ophthalmology cases.

Data analysis

Data obtained from the completed questionnaires were entered into the SPSS version 21 (Statistical Packages for the Social Sciences) for analysis. A p -value < 0.05 was considered as statistically significant. Data analysis was initiated with a check of the data for outliers, missing data, and normality through skewness and kurtosis values that could affect relations between variables. A descriptive statistical analysis of the data (means, standard deviations, ranges, frequencies and percentages, etc.) were conducted. The Kruskal Wallis test and Analysis of variance (ANOVA) were used to identify the differences in ophthalmology knowledge between GPs from different universities, as well as different curricula within each university based on time spend in ophthalmology during undergraduate training.

Ethical considerations

The University of KwaZulu-Natal (UKZN) Biomedical Research Ethics Committee (BREC) has given full ethical approval and advised that the study may commence on 19 June 2014. The acceptance and approval of the study by this committee signified that the research was compliant with the South African National Research Ethics guidelines from 2004. UKZN BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). The data collected was handled completely anonymous. In terms of the GPs who participated in the research project, they gave their full informed consent, agreeing that participation was entirely voluntary and that they may withdraw from the study at any given time.

211 **Results**

212 Response rate

213 Of the 97 GPs who were invited to participate in the research project, 79 responded by
214 completing the emailed questionnaire, implying a response rate of 81.4%.

215 Primary eye care core knowledge

216 The following section contains the results of each question pertaining primary eye care
217 conditions a GP can be confronted with in general private practice.

218 **Symptoms and complaints of associated with anterior uveitis**

219 In a question describing a patient presenting with anterior uveitis, 29.1% of respondents
220 answered incorrect. Twenty-two (27.8%) of the respondents who answered incorrectly,
221 thought that acute angle closure glaucoma is the most likely cause of these complaints
222 and not anterior uveitis. One respondent (1.3%) used the option to defer referral and
223 rather first just treat with topical antibiotics for 7 days.

224 **Management of anterior Uveitis**

225 Forty-five (57.0%) of the respondents did not know the treatment of uveitis. Some
226 respondents (44.3%) stating that atropine should be added to Chloramphenicol, while
227 others (5.1%) stated that a beta-blocker must be added. Some respondents (7.6%)
228 believed that Chloramphenicol drops had better absorption in the eye. Only 43%
229 respondents knew that Chloramphenicol was not the treatment for uveitis.

230 **Diagnosis of acute angle closure glaucoma**

231 Many respondents (35.4%) also indicated that the diagnosis of acute angle closure
232 glaucoma before referral to an ophthalmologist should include an abnormal visual field
233 and increased intraocular pressure. The majority (58.2%) chose the more correct answer

of a fixed pupil and increased intraocular pressure. Severe head ache with and aura and a cup to disc ratio of 0.7 was indicated as the clinical symptoms and signs to diagnose acute angle closure glaucoma by 2.5% of respondents and 3.8% of respondents indicated that the symptoms to take note off when diagnosing acute angle closure glaucoma, was a cup to disc ratio of more than 0.6 and a decrease in visual fields.

Clinical signs of proliferative diabetic retinopathy

Despite the prevalence of diabetic mellitus 51.9% of respondents could not correctly identify the fundoscopy findings in proliferative diabetic retinopathy. Many respondents (38.0%) indicated the clinical sign is yellow exudates in the macula, 6.3% noted that it is a cataract formation in a diabetic patient and 7.6% specified a pale optic disc as clinical sign.

Diagnosis of probable refractive error

In terms of complaints of long-standing blurred vision that improves dramatically with a pinhole, most respondents (73.5%) were not able to identify the cause or appropriate management. The majority (57%) suggested that such a patient should be referred to an ophthalmologist. Lenticular opacification was indicated by 1.3% respondents as the reason for the symptoms while presbyopia was diagnosed by 15.2% of respondents.

Diagnosing and interpreting of a pupil involving third nerve palsy

Up to 50.6% of respondents were unable to grasp the possible urgency associated with these signs and symptoms. Nineteen (24.1%) of these even opted to only follow up on the patient later, while 12.7% of respondents suspected upper lid ptosis and 13.9% stated that the globe will be deviated medially. Less than half of the respondents (49.4%) did make a differential diagnosis which included a life-threatening cerebral aneurysm.

258 **Testing for relative afferent pupil defect**

259 Even though 67.1% of respondents could identify a relative afferent pupil defect
260 (RAPD), 8.9% of them did not understand the significance of this important clinical
261 sign.

262 **The importance of topical dexamethasone for herpes simplex dendritic ulcers**

263 Excellent response came in the question on Herpes Simplex treatment with 96.2% of
264 respondents knowing that steroids is contra indicated during initial treatment.

265 **Management of a patient with a foreign body in the eye**

266 Twenty-six (32.9%) of respondents would correctly evert the upper lid to make sure
267 there is no hidden foreign bodies. Twenty-Eight (35.4%) of the respondents did not
268 plan to undertake any active treatment on presentation and only focused on prevention
269 of future injuries.

270 **Diagnosing and treating a patient seeing flashing lights and floaters**

271 Most respondents (83.5%) correctly identified the patient's symptoms as putting them
272 at risk for a retinal detachment

273 **Demographic and background information of participants**

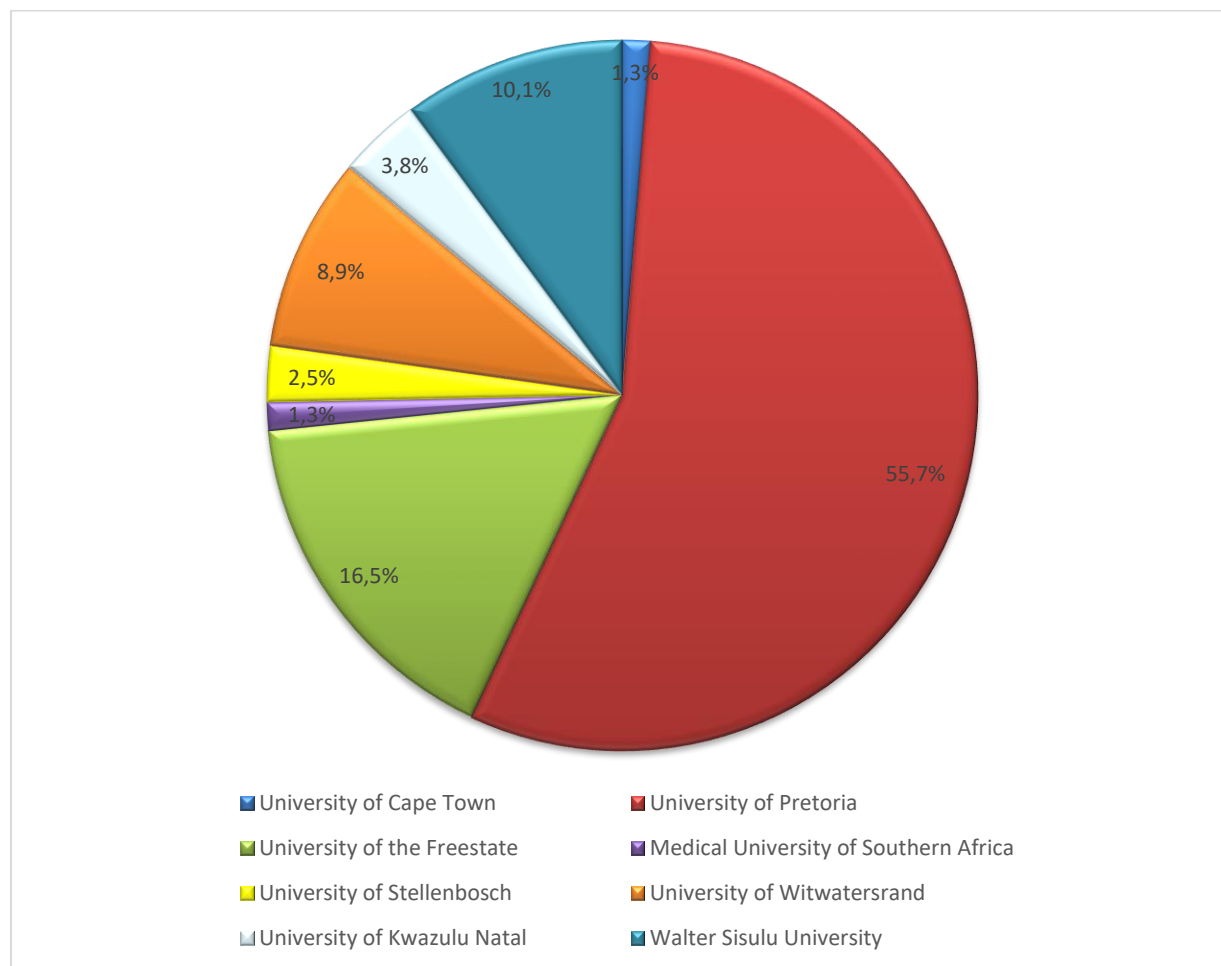
274 **Gender**

275 Sixty-seven (84.8%) of the respondents were male and only 12 (15.2%) were female.

276 **Undergraduate Training**

277 Most of the respondents graduated at the University of Pretoria (55.7%). Twenty-seven
278 (34.2%) responses from six other South African medical schools and eight (10.1%)
279 responses were graduates from a foreign school of medicine (Figure 1).

280 Interestingly, all respondents in this study who completed their undergraduate medical
 281 degree at the University of Stellenbosch, the University of Freestate and the University
 282 of the Witwatersrand had a 100% pass rate for the core knowledge test, meaning these
 283 respondents scored 50% or more on the test. The respondents who graduated from the
 284 University of Pretoria only had five candidates that did not achieve a pass mark of 50%
 285 or more (11% of their candidates). Twenty-Five percent of the the Walter Sisulu
 286 University candidates did not pass the test. The lack of equal representation by all
 287 Universities limited any further observations regarding the training programmes at the
 288 different universities.



289
 290 **Figure 1: Respondents undergraduate training facility**

Time spent in Ophthalmology during undergraduate training

During undergraduate medical studies, education is done in rotation schedules or blocks. Thirty-three (41.8%) respondents spend only one to two weeks and 24 (30.4%) spend 3 to 4 weeks in an ophthalmology rotation during their undergraduate studies. Only 8 respondents had an ophthalmology rotation longer than 4 weeks while 11 (13.9%) respondents had less than a week training and 3 (3.8%) had no training in ophthalmology (Figure 2).

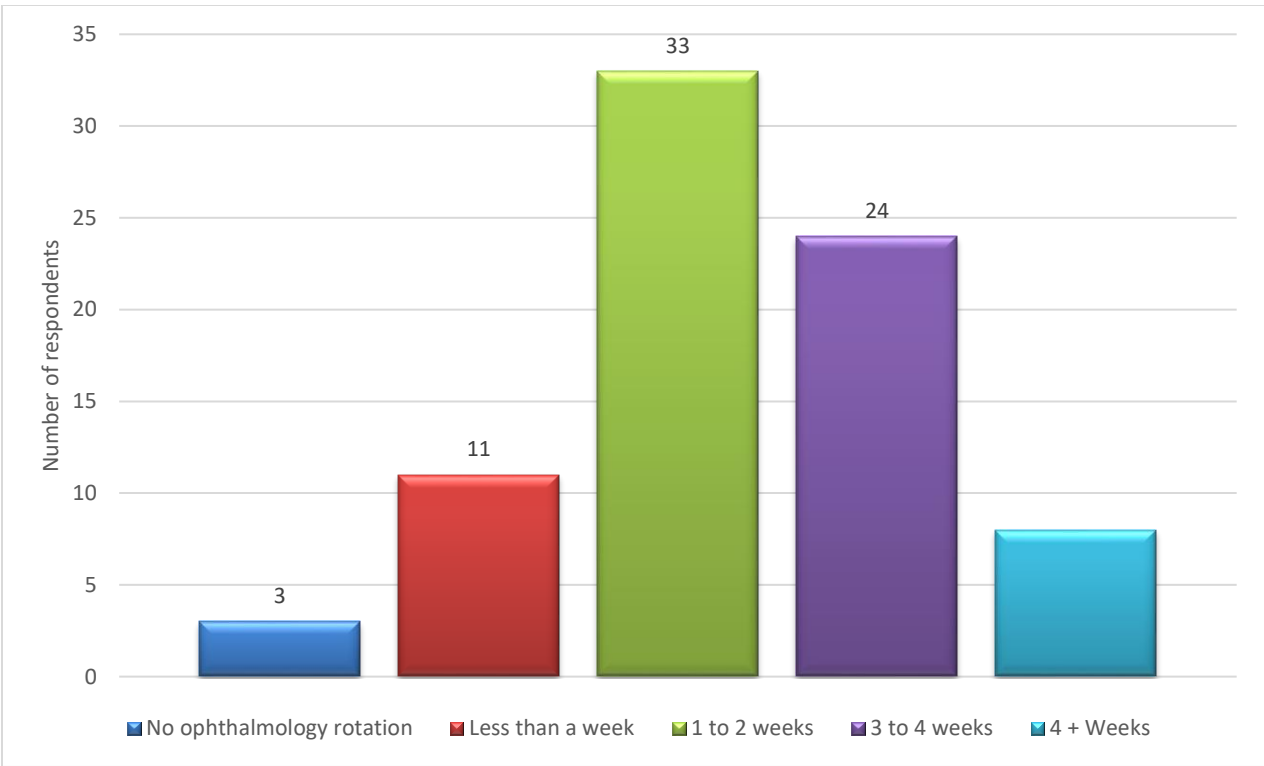


Figure 2: Duration of Ophthalmology rotation during undergraduate studies

Those respondents who spent 1-2 weeks (33) and 3-4 weeks (24) on ophthalmology rotation performed better in the core knowledge test. A positive significant correlation ($p = 0.01$) exists between the time spent in an Ophthalmology rotation and the mean test score in the core knowledge test.

Correlation between time spent in Ophthalmology during undergraduate training and mean core knowledge test scores

Sixty-seven (84.8%) respondents scored 50% or more on the core knowledge test while twelve (15.2%) scored less than 50% on the core knowledge test (Figure 3). The mean test score was 5.671 and the Standard Deviation (SD) was 1.59.

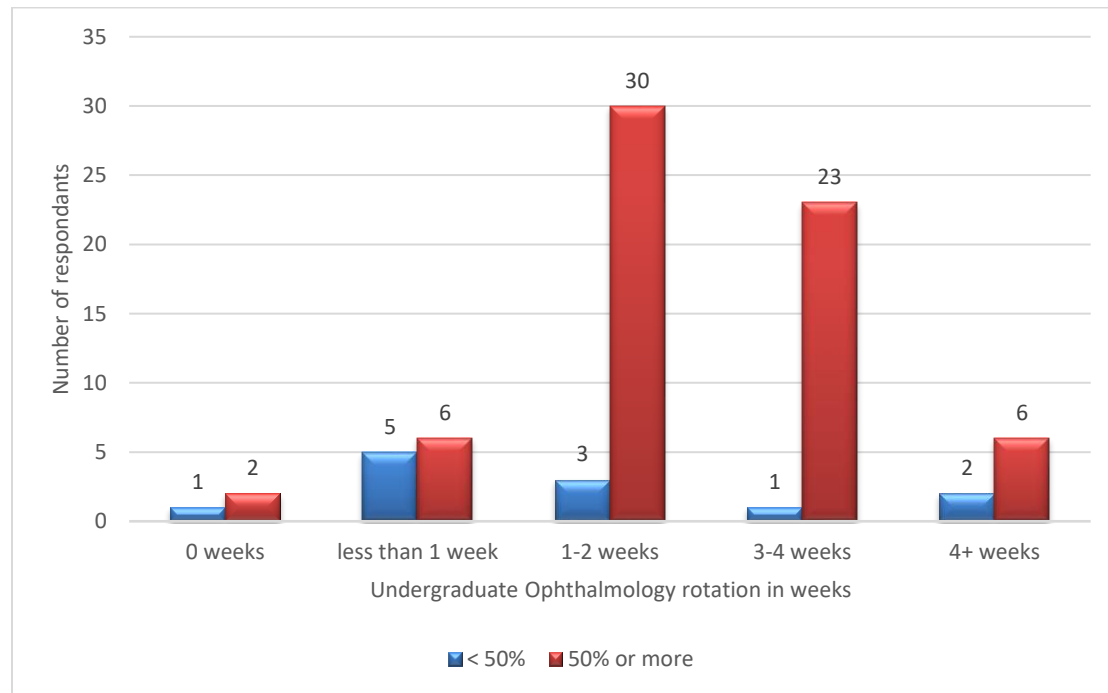


Figure 3: Correlation between mean core knowledge test score and duration of ophthalmology rotation

With a more in-depth observation into the scores of the group achieving a pass score, twenty (25.3%) respondents scored 7 or more and 30.4% respondents answered 6 out of the 10 core knowledge questions correct. Twenty-three (29.1%) respondents scored 5 out of 10.

Post-graduate qualifications

Thirty (38%) respondents had extra qualifications, but there was no significant indication ($p=0.09$) that it improved their knowledge regarding eye.

Number of years' experience

Most of the respondents (51.9%) were in private practice for longer than 30 years, 17.7% had been in private practice for 25 to 30 years, 5% for 20 to 25 years and 10.1% for 15 to 20 years. Only 15.2% were in private practice for less than 15 years (Figure 4).

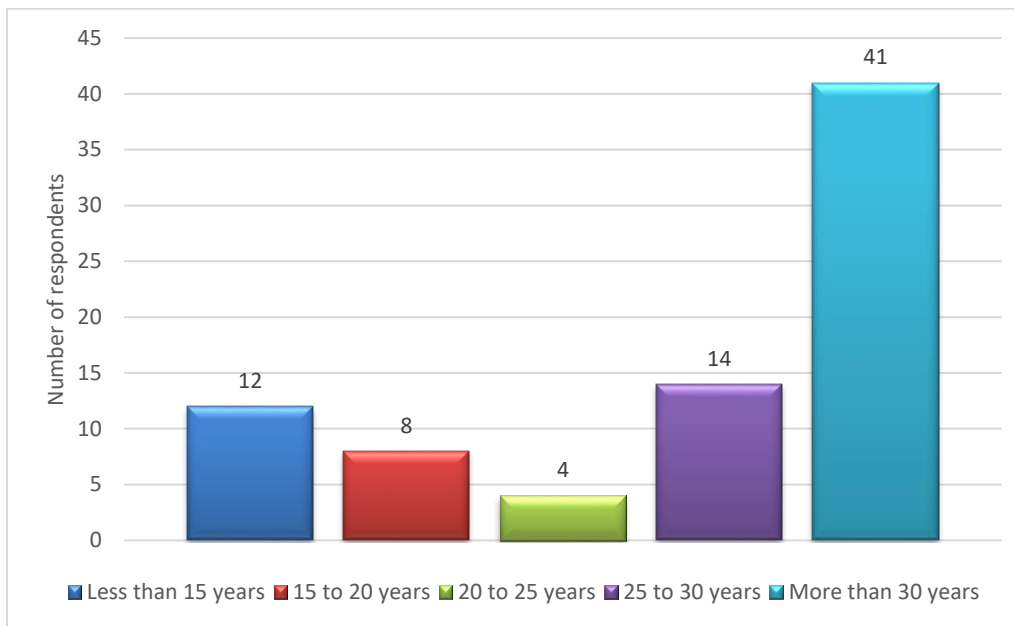


Figure 4: Years of experience in private practice

There was no significant relationship ($p=0.058$) between the number of years' experience in general private practice and the knowledge of the respondents regarding eye care management.

Estimated eye care caseload in general practice

Thirty-Four (43.5%) respondents estimated that between 0% and 9% of their case load consisted of patients seeking eye care while 32 (40.5%) respondents projected that the number of patients in their practices seeking eye care was between 10 and 19%. Between 20% and 29% of patients were seeking assistance with regards to eye care in 13.9% of practices. Two and a half percent of respondents estimated a case load for eye care of between 30% and 39% (Figure 5). Unfortunately, the questionnaire did not

request further information to clarify if the participants seeing more cases had any special interest in ophthalmology or had any other reason for seeing more cases.

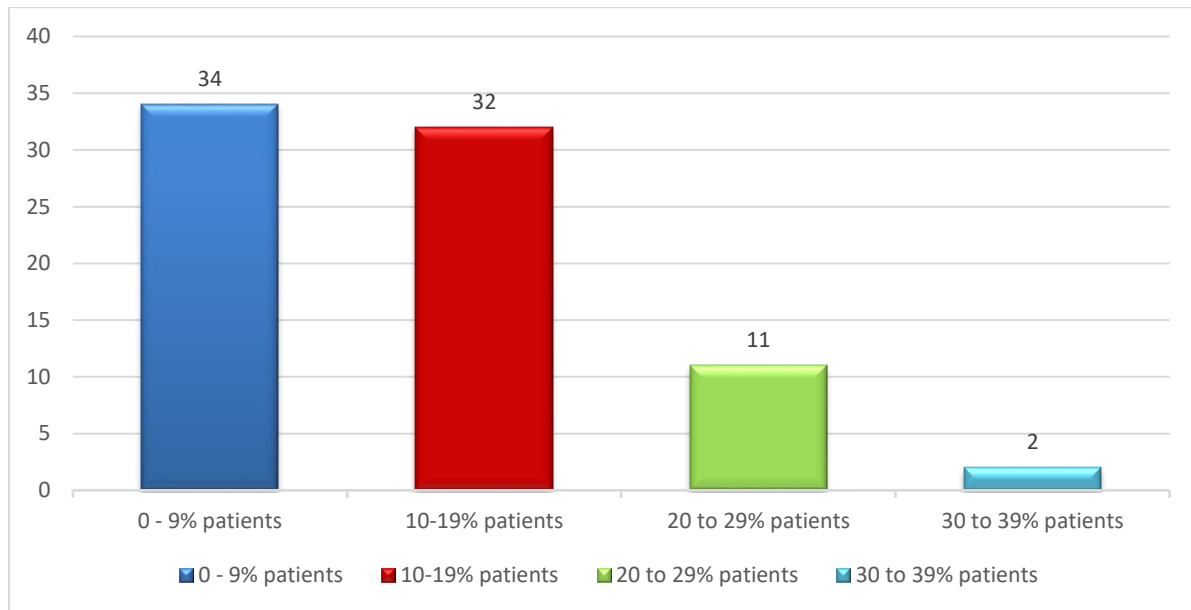


Figure 5: Estimated patients with eye care complaints seen at private practice

Respondents rating of own knowledge

When asked to rate their own knowledge in ophthalmology nineteen (24.1%) respondents indicated that their knowledge was a 5 on a scale of 1 to 10, with 1 being very poor and 10 being excellent. Sixteen respondents (20.2%) indicated their knowledge was above average and forty-four respondents (55.7%) perceived their knowledge as below average (Figure 6). The mean was 4.342 and the SD was 1.95. There was no significant difference between self-rating of their knowledge and their test scores ($p=0.093$). In fact, all respondents (100%) indicated in their questionnaire that they think extra courses on eye care management are essential and they would attend such courses.

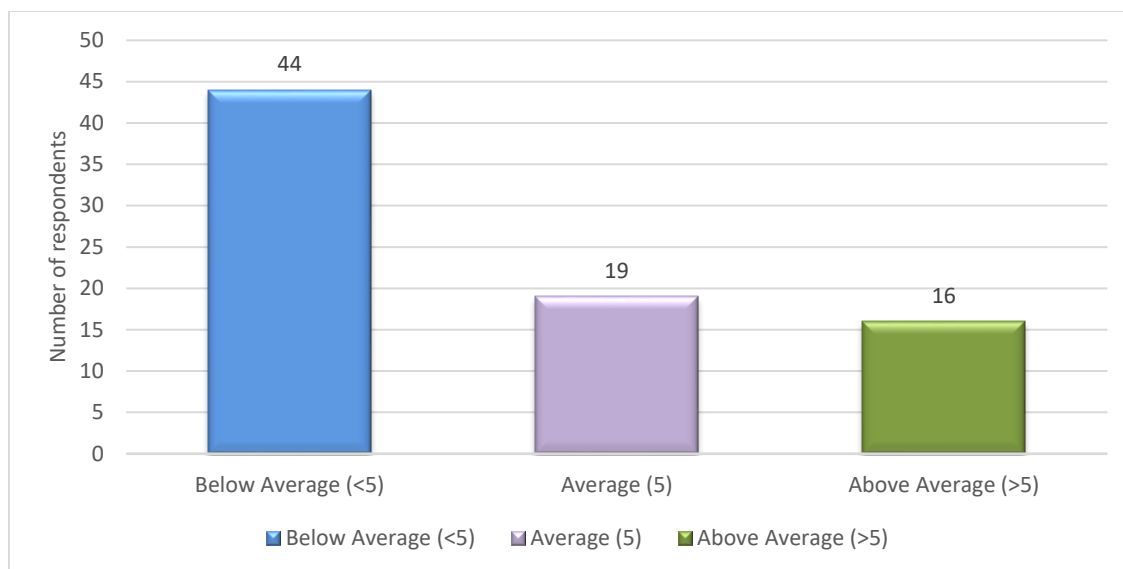


Figure 6: Respondents rating their own knowledge out of 10

Professional responsible for primary eye care management

Sixty-five (82.3%) respondents indicated that the GP is responsible for primary eye care management while only fourteen (17.7%) respondents indicated that the optometrist is responsible for managing primary eye care complaints.

Discussion

GPs should have optimal primary care knowledge and skills to be efficient and effective in the management of their patients' eye care problems and complaints. High quality, safe and effective primary ophthalmic care is of utmost importance since GPs are the first professional to be confronted with eye care problems.² In this study, it was clear that the knowledge of GPs is insufficient which is similar to the findings of a study conducted by Van Zyl et al. in 2011.⁸ The lack of knowledge seems to be a concern globally with research done all over the world, indicating similar results.^{12-14, 17, 22}

This study indicated that the GPs in the Vaal Triangle are often confronted with patients with eye care complaints just like their counterparts worldwide. According to the WHO, these caseloads are growing around the world.¹ What is concerning is that the majority of GPs clearly stated that they do not have enough knowledge to treat these patients optimally. Thus, even though they are regularly confronted with these eye care conditions, they are not confident in the management thereof or able to make appropriate and timely referrals. Interestingly, they were correct in their perception of their lack of knowledge since there was no significant difference between their perception of lack of sufficient knowledge regarding eye care problems and their poor mean test scores obtained in the core knowledge test. These results also coincide with the findings in similar studies conducted.⁸

More specifically, a lack of knowledge about eye conditions such as anterior uveitis, acute angular glaucoma and proliferative diabetic retinopathy were clearly noticeable. A condition such as Diabetes Mellitus, which is a frequently encountered medical condition, could have severe eye complications. However, most GPs did not know the clinical signs of proliferative diabetic retinopathy. A life-threatening condition such as a cerebral aneurysm should not be missed, yet most GPs did not indicate this condition as part of their differential diagnosis in a pupil involving third nerve palsy.

Furthermore, many GPs did not know how to test for a RAPD or how to interpret this important finding. Risk for retinal detachment was identified quite easily by most GPs. Findings did also indicate that the majority of GPs were able to identify the correct treatment for Herpes Simplex corneal ulcers. However, it is concerning that there was some, in this case 3, GPs that did not know topical steroid treatment is completely contraindicated and may play a significant role in iatrogenic blindness.

From these findings, it was clear that many GPs had difficulty making appropriate referrals to the ophthalmologist and the optometrist. In terms of complaints in keeping with refractive error GPs incorrectly wanted to refer these patients to the ophthalmologist. A study done by Tuck and Crick²³ suggest that closer cooperation is necessary between consultants, GPs and optometrists to improve management of glaucoma. Even though they focused on glaucoma during their study, the conclusions can be made applicable to most primary eye care conditions.

On the management of a patient with a possible foreign body in the eye, most GPs were unable to identify the appropriate basic examination and institute the correct treatment. Most GPs were unsure, even in this scenario, when to refer to an ophthalmologist. This concurs with the research findings of Van Zyl et al.⁸ who found that GP referrals to an eye emergency unit did not constitute emergency conditions.

The results from this research indicated that the knowledge of the GPs was most likely shaped by their undergraduate training program. A statistical significant relationship was identified between the knowledge of the GPs and the duration of the ophthalmology rotation during their undergraduate study. These results suggest that those respondents who spent more time in an Ophthalmology rotation during their undergraduate studies, could answer more core knowledge questions correctly. These findings coincide with the results of Succar et al.² who emphasized the need for good,

thorough undergraduate ophthalmology training based on their research results. Years of experience and specializing in areas other than eye care, did not influence the respondents' knowledge of ophthalmology.

Even though GPs lack knowledge regarding primary eye care management, most GPs still felt that the GP should be the professional responsible for primary eye care management concurring with the findings made in other studies.⁸ All the GPs indicated that there is a need for extra courses to sharpen their knowledge and skill regarding eye care management and they stated clearly that they would attend such courses.

The initial diagnosis and management of the GP can be critical to the patient's ophthalmic outcome.¹⁰ Optimal knowledge and skills pertaining eye care conditions can be accomplished by appropriate and efficient training of the medical undergraduate and it could also be addressed by continuing professional development schemes.¹¹ This will aid in achieving the goal of the Vision 2020 initiative.¹

It must be noted that the cross-sectional survey study design used in this research project has many weaknesses, however the response rate of 81.4% was reasonably good. The fact that the majority (84.4%) of GPs had been in private practice for more than 15 years, reflects that they were experienced in their field. Their test score might however be influenced by possible refresher courses they attended but this was not assessed during this study

This and other similar studies points out the weakness in our current training curriculum of GPs. Curriculum developers need to take note so that undergraduate training start to include more rotation time in ophthalmology. Knowledge not acquired during this period seems to leave a gap to treat patients optimally during the full career of the GP. Again, it should be stated that refresher courses can help to improve this knowledge.

A big limitation to the study was that in South Africa those patients who present to private GPs may have a very different spectrum and/or severity of diseases compared to those presenting to state facilities. Many private patients may choose to go straight to an ophthalmologist because access is relatively easy. GPs in a Government institution may have a different level of exposure to a different patient profile. Hence the conclusions may not be generalisable.

Conclusion

GPs are in fact most of the time, the first professionals to be consulted for many ophthalmic conditions as noted by Van Zyl et al.⁸ The results also confirmed that GPs might not have sufficient knowledge to diagnose and treat primary eye care conditions. This insufficient knowledge and skills concerning ophthalmology in the general practice may significantly impact patient care and contribute to poor management of eye care problems.¹¹. The lack of knowledge can most probably be explained by too little time spent on ophthalmology training during undergraduate study which is not unique to South Africa but a problem that is raising concerns globally.

447 **Acknowledgements**

448 Competing interests

449 The authors declare that they have no financial or personal relationships which may
450 have inappropriately influenced them in writing this article.

451 Authors' contributions

452 J.T.D.L(University of KwaZulu-Natal) was responsible for the study design, collection
453 of data and writeup of data. All the research was done under supervision of C.K.
454 (University of KwaZulu-Natal)

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504

Appendices

Appendix 1: The final Study Protocol

Protocol

Dr. Johannes Tobias de Lange Student Number 213571849

Title of study

The knowledge and perception of General Practitioners in the Vaal Triangle concerning common eye diseases and the role of the ophthalmologist

Aim of study

This research aims to investigate the knowledge of General Practitioners in the Vaal Triangle regarding common eye diseases and to determine their perception of the role of the ophthalmologist in the treatment of common eye diseases

To identify areas where the undergraduate ophthalmic program can be addressed to improve General Practitioner (GP) performance in this area

Specific objectives

To determine the deficiencies in knowledge, if any, on common and important eye diseases in GPs in the Vaal Triangle. This includes diagnosis and management

To explore whether GP's can identify urgent eye cases and know when to appropriately refer cases to an ophthalmologist. Special emphasis will be made on diabetic retinopathy.

To identify the differences in ophthalmology knowledge between GPs from different universities, as well as different curricula within each university based on time spent in ophthalmology during undergraduate training.

Background and Literature

The World Health Organisation (WHO)¹ estimated that the incidence of avoidable visual impairments will increase significantly over the next few years. In 2006, it was projected that 314 million people globally had impaired vision due to eye diseases or uncorrected refractive errors and 45 million were blind. However, these numbers were projected to increase drastically.

In order to eliminate the incidence of avoidable blindness by 2020, the WHO and the International agency for the prevention of blindness (IAPB) initiated an action plan called Vision 2020: The Right to Sight. However, to achieve this goal, it is imperative that effective eye care services be integrated into the primary health-care system. This includes the services of General Practitioners in our country.

In Britain, the incidence of eye disease is about 3% in General Practice.² Van Biljon³ noted in 1957 that the eye disease incidence in general practice is 5.3% in South Africa. Levy⁴ stated that: "Although General Practitioners are concerned with the entire body, ocular ailments are inordinately frequent" and Van Zyl et al.⁵ mentioned that a substantial amount of patients with common eye problems are seen at primary health care levels which includes the offices of General Practitioners. This suggests that medical doctors are often the first to be consulted regarding common eye problems or medical problems leading to eye complications. These problems often include diseases such as diabetes mellitus which is well known for its severe eye complications if not managed promptly and proactively.⁶

According to the study conducted by Leslie and Nkombua in 2012 ⁶, it was evident that attention should be given to the knowledge and skills of General practitioners since only 36% of General Practitioners conducted an eye examination in patients with diabetes mellitus, while the lack of referrals to the ophthalmologist, in this study it was only 22% of General Practitioners, also raised concerns. This reflects directly on graduate training programmes in South Africa and possibly worldwide. Studies concerning training of medical doctors in Canada,⁷ UK, Australia, New Zealand as well as the USA⁵ have indicated that there is a problem of inadequate ophthalmology training and inadequate eye care by primary health care doctors. General Practitioners should have optimal knowledge and skills to be efficient and effective in the management of their patients in order to avoid eye diseases and therefore aid in achieving the goal of the Vision 2020 initiative

Having been in Private GP Practice myself for five years and then starting to specialise, I realised that the undergraduate exposure to Ophthalmology is most probably insufficient. During my interaction with colleagues at a GP level, I found that this is a common feeling and that this contributed to uncertainty in treatment of patients with "eye problems". Having

also interacted with Alumni from different medical schools I feel that there might be no standard level of exposure and knowledge. This will be examined.

Key References: (Give approximately 5 key references).

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7. Noble J, Somal K, Gill HS, Lam WC. An analysis of undergraduate ophthalmology training in canada. Canadian journal of ophthalmology. Journal canadien d'ophtalmologie. 2009;44(5):513-518.

Study design

An observational descriptive cross-sectional study

Observational: No interventions to be done

Descriptive cross-sectional: The study aims to take a snap-shot of the current situation

Study population

General practitioners (GP's) registered with the Health Professional Council of South Africa (HPCSA) and also registered with the Board of Healthcare Funders (BHF) as being in private practice.

Sampling strategy

Purposive sampling as all the participants registered will be invited to participate in the study

Statistical planning (variables / confounders)

Variables include:

Age of participants

Sex of participants

Year of tertiary qualification

University wear qualified

Undergraduate ophthalmology experience

Confounder Include:

The number of Ophthalmologists and Optometrists readily available might influence where patients present. The physical location of a practice might influence the amount of eye patients seen. If the practice for instance is in close proximity to Optometrist or even an Ophthalmologist patients with eye problems might not be seen at the General Practitioner first.

Structured Post Graduate Ophthalmology experience for example having worked in an eye clinic before

Participants with a Diploma in Ophthalmology

Almost all variables and confounders listed above are also in the questionnaire as closed end questions and will in this not cause a problem when statistical analysis is drawn.

Sample size

No sampling. All private GPs in the Vaal triangle (Vanderbijlpark, Vereeniging, Sasolburg) will be included that is registered with the HPCSA and BHF.

Inclusion / exclusion criteria

Inclusion Criteria

General Practitioners (GP's) registered with the Health Professional Council of South Africa (HPCSA) and registered with the Board of Healthcare Funders (BHF) as being in private practice in the Vaal Triangle

Exclusion Criteria

- General practitioners in the Vaal Triangle that are not in private practice.
- General practitioners that took part in the pilot study for this specific study

Data collection methods and tools

A Pilot study will be undertaken to test the feasibility of the questionnaire. For this purpose 10 General Practitioners not necessary meeting the inclusion criteria will be requested to complete the questionnaire. Feedback will be asked from these 10 General Practitioners afterwards to determine if amendments need to be made to the questionnaire.

This will also help to see if statistical analysis can be drawn from the questionnaire

Data analysis techniques

Data will be collected by means of a questionnaire. The questionnaires will be emailed to each candidate. The candidates will be requested not to refer to textbooks when completing the questionnaire.

All the research documents and completed questionnaires will be filed and kept for the five years on my personal computer. Data gathered from the questionnaire will be entered and kept in a spread sheet program to ease the access to the data. During the course of the study

regular backups of the data will be made in the form of a data Compact Disc. All questionnaires, original data collected and backups will be destroyed after 5 years.

Statistical analysis

Data will be entered into SPSS version 21 (Statistical Packages for the Social Sciences) for analysis. A p value <0.05 will be considered as statistically significant. Data analysis will initiate with a check of the data for outliers, missing data, and normality through skewness and kurtosis values that could affect relations between variables. A descriptive statistical analysis of the data (means, standard deviations, ranges, frequencies and percentages, etc.) will be conducted. The Kruskal Wallis test and ANOVA will be used for identifying the differences in ophthalmology knowledge between GPs from different universities, as well as different curricula within each university based on time spend in ophthalmology during undergraduate training

Study location

Vaal Triangle (Vanderbijlpark, Vereeniging, Sasolburg)

Study period

	Protocol	Data Capture	Data analysis	Write-up
Feb – Jun 2014				
Jul – Sept 2014				
Sept – Dec 2014				
Jan – Mar 2015				

Limitations to the study

This study is only conducted in one centre. GP's might all fall more or less in the same age group and might be limited to only graduates from a few universities and so only reflect views according to their experience and training and not necessarily the country norm.

There is no control that participants will stick to the instructions of the questionnaire not to refer to textbooks.

Possible poor response rate will be limited by personal interaction with former colleagues. This will be done with follow up telephone calls and regular follow up e-mail.

Due to the fact that an electronic questionnaire via email will be used, the participant will only be able to “submit” the questionnaire once all questions have been answered.

Despite all efforts reply from participants might be low.

Ethical considerations

Confidentiality: No names of doctors will be used in any presentation, publication or write-up. All identifiable information will be destroyed at 5 years after completion of the study.

University identification: The various universities in South Africa will be mentioned in the study and their performances in ophthalmology teaching compared. All efforts will be made to explain that the purpose of this is to identify areas where efforts should be concentrated to facilitate improvement. The eventual outcome would be positive for the universities and our patients.

Appendix 2: The Guidelines for Authorship for African Vision and Eye Health


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Page 2 and onwards

Title: The article's full title should contain a maximum of 95 characters (including spaces).

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- **Background:** Summarise the social value (importance, relevance) and scientific value (knowledge gap) that your study addresses.
- **Aim:** State the overall aim of the study.
- **Setting:** State the setting for the study.
- **Methods:** Clearly express the basic design of the study, and name or briefly describe the methods used without going into excessive detail.
- **Results:** State the main findings.
- **Conclusion:** State your conclusion and any key implications or recommendations.

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The following headings serve as a guide for presenting your research in a well-structured original article. As an author you should include all first-level headings, but subsequent headings (second- and third-level headings) can be changed.

Introduction (first-level heading)

The introduction must contain your argument for the social and scientific value of the study, as well as the aim and objectives:

Social value: The first part of the introduction should make a clear and logical argument for the importance or relevance of the study. Your argument should be supported by use of evidence from the literature.

Scientific value: The second part of the introduction should make a clear and logical argument for the originality of the study. This should include a summary of what is already known about the research question or specific topic, and should clarify the knowledge gap that this study will address. Your argument should be supported by use of evidence from the literature.

Conceptual framework: In some research articles it will also be important to describe the underlying theoretical basis for the research and how these theories are linked together in a conceptual framework. The theoretical evidence used to construct the conceptual framework should be referenced from the literature.

Aim and objectives: The introduction should conclude with a clear summary of the aim and objectives of this study.

Research methods and design (first-level heading)

The methods should include:

Study design (second-level heading): An outline of the type of study design.

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Study population and sampling strategy (second-level heading): Describe the study population and any inclusion or exclusion criteria. Describe the intended sample size and your sample size calculation or justification. Describe the sampling strategy used.
Describe in practical terms how this was implemented.

Intervention (if appropriate) (second-level heading): If there were intervention and comparison groups, describe the intervention in detail and what happened to the comparison groups.

Data collection (second-level heading): Define the data collection tools that were used and their validity. Describe in practical terms how data were collected and any key issues involved, e.g. language barriers.

Data analysis (second-level heading): Describe how data were captured, checked and cleaned. Describe the analysis process, for example, the statistical tests used or steps followed in qualitative data analysis.

Ethical considerations (second-level heading): Approval must have been obtained for all studies from the author's institution or other relevant ethics committee and the institution's name and permit numbers should be stated here.

Results (first-level heading)

Present the results of your study in a logical sequence that addresses the aim and objectives of your study. Use tables and figures as required to present your findings. Use quotations as required to establish your interpretation of qualitative data.

All units should conform to the **SI convention** and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Discussion (first-level heading)

The discussion section should address the following four elements:

Key findings: Summarise the key findings without reiterating details of the results.

Discussion of key findings: Explain how the key findings relate to previous research or to existing knowledge, practice or policy.

Strengths and limitations: Describe the strengths and limitations of your methods and what the reader should take into account when interpreting your results.

Implications or recommendations: State the implications of your study or recommendations for future research (questions that remain unanswered), policy or practice. Make sure that the recommendations flow directly from your findings.

Conclusion (first-level heading)

Provide a brief conclusion that summarises the results and their meaning or significance in relation to each objective of the study.

Acknowledgements (first-level heading)

If, through your study, you received any significant help in conceiving, designing or carrying out the work, or received materials from someone who did you a favour by supplying them, you must acknowledge their assistance and the service or material provided. **Authors should always acknowledge outside reviewers of their drafts and any sources of funding that supported the research.**

Competing interests (second-level heading): A competing interest exists when your interpretation of data or presentation of information may be influenced by your personal or financial relationship with other people or organisations that can potentially prevent you from executing and publishing unbiased research. Authors should disclose any financial competing interests but also any non-financial competing interests that may cause them embarrassment were they to become public after the publication of the manuscript. **Where an author has no such competing interests, the listing will read as follows:** 'The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.'

Authors' contributions (second-level heading): This section is necessary to give appropriate credit to each author, and to the authors' applicable institution. The individual contributions of authors should be specified with their affiliation at the time of the study and completion of the work. An 'author' is generally considered to be someone who has made substantive intellectual contributions to a published study. Contributions made by each of the authors listed can follow the example below (please note the use of authors' initials):

J.K. (University of Pretoria) was the project leader, L.M.N. (University of KwaZulu-Natal) and A.B. (Stellenbosch University) were responsible for experimental and project design. L.M.N. performed most of the experiments. P.R. (Cape Peninsula University of Technology) made conceptual contributions and S.T. (University of Cape Town), U.V. (University of Cape Town) and C.D. (University of Cape Town) performed some of the experiments. S.M. (Cape Peninsula University of Technology) and V.C. (Cape Peninsula University of Technology) prepared the samples and calculations were performed by C.S. (Cape Peninsula University of Technology).

References (first-level heading)

Begin the reference list on a separate page, and give no more than 60 references in all. The *African Vision and Eye Health* uses the **Vancouver referencing style**, details of which can be downloaded from the journal website. **Note: No other style will be permitted.**

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Brien Holden Vision Institute

Appendix 3: Ethical approvals



UNIVERSITY OF
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19 June 2014

Dr Johannes Tobias de Lange
P O Box 138
Urhlanga Rocks
4320
jodel@webmail.co.za

PROTOCOL: The Knowledge and Perception of General Practitioners in the Vaal Triangle concerning common eye diseases and the role of the ophthalmologist. REF: BE013/14

EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application, received on 06 January 2014.

The study was provisionally approved pending appropriate responses to queries raised. Your responses received on 20 May 2014 to queries raised on 18 March 2014 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given full ethics approval and may begin as from 19 June 2014.

This approval is valid for one year from 19 June 2014. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2004), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its meeting taking place on 08 July 2014.

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor D.R. Wassenaar
Chair: Biomedical Research Ethics Committee

Professor D Wassenaar (Chair)
Biomedical Research Ethics Committee
Westville Campus, Gavin Mbeki Building
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 2084 Facsimile: +27 (0)31 260 4609 Email: brec@ukzn.ac.za
Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>
Resembling Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

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Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics-4608>

12 June 2015

Dr Johannes Tobias de Lange
P O Box 138
Umhlanga Rocks
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PROTOCOL: The Knowledge and Perception of General Practitioners in the Vaal Triangle concerning common eye diseases and the role of the ophthalmologist. REF: BE013/14

RECERTIFICATION APPLICATION APPROVAL NOTICE

Approved: 19 June 2015
Expiration of Ethical Approval: 18 June 2016

I wish to advise you that your application for Recertification dated on 27 May 2015 for the above protocol has been noted and approved by a sub-committee of the Biomedical Research Ethics Committee (BREC) for another approval period. The start and end dates of this period are indicated above.

If any modifications or adverse events occur in the project before your next scheduled review, you must submit them to BREC for review. Except in emergency situations, no change to the protocol may be implemented until you have received written BREC approval for the change.

This approval will be ratified by a full Committee at its next meeting taking place on 14 July 2015.

Yours sincerely

Mrs A. Marimuthu
Senior Administrator: Biomedical Research Ethics



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11 May 2016

Dr Johannes Tobias de Lange
P O Box 138
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jodel@webmail.co.za

PROTOCOL: The Knowledge and Perception of General Practitioners in the Vaal Triangle concerning common eye diseases and the role of the ophthalmologist. REF: BEO13/14

RECERTIFICATION APPLICATION APPROVAL NOTICE

Approved: 19 June 2016
Expiration of Ethical Approval: 18 June 2017

I wish to advise you that your application for Recertification dated on 05 May 2016 for the above protocol has been noted and approved by a sub-committee of the Biomedical Research Ethics Committee (BREC) for another approval period. The start and end dates of this period are indicated above.

If any modifications or adverse events occur in the project before your next scheduled review, you must submit them to BREC for review. Except in emergency situations, no change to the protocol may be implemented until you have received written BREC approval for the change.

Th's approval will be ratified by a full Committee at its next meeting taking place on 14 June 2016.

Yours sincerely

Mrs A Marimuthu
Senior Administrator: Biomedical Research Ethics

Appendix 4: Data collection tools

Welcome Page

Questionnaire for General Practitioners regarding Ophthalmology

Dear Colleague

My name is Dr. Johan de Lange from the University of KwaZulu-Natal, Ophthalmology Department.

I am a Registrar in Ophthalmology currently based at McCord Hospital.

We are conducting a survey about the primary eye care knowledge of private general practitioners working in the Vaal Triangle

You are being invited to participate in the study. This research aims to investigate the knowledge of General Practitioners in the Vaal Triangle regarding common eye diseases and to determine their perception of the role of the Ophthalmologist in the treatment of common eye diseases.

A secondary aim is to identify areas where the undergraduate ophthalmic program can be addressed to improve General Practitioner (GP) performance in this area. The study is expected to enrol most of the Private General Practitioners in the Vaal Triangle. By conducting the study we hope that we can look at ways to improve the training at an undergraduate level and via the CPD system, ultimately leading to better primary eye care for all patients.

This study has been ethically reviewed and approved by the UKZN Biomedical research Ethics Committee (Reference number BE013/14).

In the event of any problems or concerns/questions you may contact the researcher at **082-447 1048** or **jodel@webmail.co.za** or the UKZN Biomedical Research Ethics Committee (contact details as below):

The study has been overseen by the UKZN
BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
University of KwaZulu-Natal
Private Bag X 54001, Durban, 4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

Instructions

Please assist us with this survey by taking 15 minutes to complete the attached questionnaire.

All your answers will be anonymous and no name will be attached to any data analysis.

Please answer the questions without reference to any text books, notes, or journals.

Mark ONLY the MOST correct answer

Thank you.

1) A PATIENT PRESENTS WITH AN UNILATERAL, PAINFUL, RED EYE WITH HAZY VISION, PHOTOPHOBIA AND A SMALL PUPIL	
Acute angle closure glaucoma is the most likely cause	
Pterygium is the most likely cause	
Anterior uveitis is the most likely cause	
The patient should be treated with topical antibiotics for 7 days and referred to the ophthalmologist if it does not resolve	

2) HOW DO YOU DIAGNOSE ACUTE ANGLE CLOSURE GLAUCOMA BEFORE REFERRAL TO AN OPHTHALMOLOGIST?	
A red painful eye, irregular pupil, decreased vision, increased intra-ocular pressure (IOP), decreased visual fields.	
A red painful eye, fixed pupil, decreased vision, increased IOP.	
A cup: disc ratio of more than 0.6 and a decrease in visual fields.	
Severe headache with an aura and a cup: disc ratio of 0.7.	

3) IS THE INITIAL TREATMENT OF UVEITIS CHLORAMPHENICOL (ANTIBIOTIC) OINTMENT?	
Yes, but atropine drops should be added	
No, chloramphenicol drops have better absorption into the eye	
No, chloramphenicol in any form is not treatment for uveitis.	
Yes, but a beta-blocker must be added.	

4) WHAT IS THE CLINICAL SIGN OF PROLIFERATIVE DIABETIC RETINOPATHY?	
Yellow exudates in the macula.	

New vessels on the retina.	
Cataract formation in a diabetic patient.	
A pale optic disc.	

5) A YOUNG PATIENT PRESENTS TO YOU WITH A HISTORY OF LONG-STANDING BLURRED VISION. THE VISION IN BOTH EYES IMPROVES DRAMATICALLY WITH PINHOLE. THE FOLLOWING WOULD BE THE MOST APPROPRIATE:

The patient requires referral to an ophthalmologist.	
This scenario typically occurs in patients with lenticular opacification.	
The patient may be near or far sighted and needs glasses.	
Presbyopia is the most likely underlying refractive error.	

6) IN A PATIENT WHO PRESENTS WITH HEADACHE AND A COMPLETE THIRD NERVE PALSY OF RECENT ONSET, WITH THE PUPIL INVOLVED:

Upper lid ptosis is not expected.	
The dilated pupil would make cerebral aneurysm a possible cause	
The globe will be deviated medially.	
The patient should be investigated for an underlying cause and followed up later.	

7) HOW DO YOU TEST FOR A RELATIVE AFFERENT PUPIL DEFECT AND WHAT DOES IT SIGNIFY?

The swinging light test which signifies retinal or optic nerve disease.	
The swinging light test which signifies a dense cataract.	
The direct light test which signifies a dense cataract where light can't reach the retina.	
The strobe light test which signifies that the patient might be epileptic.	

8)
HOW IMPORTANT IS THE USE OF TOPICAL DEXAMETHASONE (A STEROID) FOR HERPES SIMPLEX DENDRITIC ULCER?

Extremely important to preserve corneal clarity.	
It should only be used while the ulcer is still visible with fluorescein staining.	
It should be avoided at all cost.	
It should be used with oral acyclovir as cover.	

9) A MECHANIC PRESENTS WITH PAINFUL RED EYES ABOUT 6 HOURS AFTER

WELDING:	
He should be educated about wearing welding goggles in the future.	
It is important to evert the upper lid to exclude a foreign body.	
He should be discharged home with antibiotic ointment and cycloplegic drops for follow up in 48 hours if he is not feeling better.	
Topical anaesthetic drops should be instilled regularly until the pain disappears.	

10) 10. A PATIENT SEES FLASHING LIGHTS AND FLOATERS. WHAT IS THE PATIENT IN DANGER OF DEVELOPING?	
A malignant brain tumour compressing the visual centre in the occipital lobe.	
A Retinal detachment.	
Acute angle closure glaucoma	
Dry eye syndrome.	

11) On a scale of 1 to 10 (1= very poor; 10= excellent), how would you rate your ophthalmology knowledge?	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

12) What percentage of patients consults you in your practice with an eye problem?	
0-9%	
10-19%	
20-29%	
30-39%	
40-49%	

50-59%	
60-69%	
70-79%	
80-89%	
90-100%	

13) Do you think it is necessary that CPD courses be held to increase GP's knowledge of Ophthalmology?	
Yes	
No	

14) Would you attend such a course?	
Yes	
No	

15) Do you think a GP or an Optometrist should be responsible for primary eye care?	
GP	
Optometrist	

16) Are you:	
Male	
Female	

17) For how long have you been in Private General Practice?	
1-2 Years	
2-5Years	
5-10 Years	
10-15 Years	
15-20 Years	
20-25 Years	
25-30 Years	
More Than 30 Years	

18) At which university did you complete your MBChB/ MBBCh/ MBBS?	
---	--

University of Cape Town (UCT)	
University of Pretoria (Pret)	
University of the Free State	
Medical University of Southern Africa (MEDUNSA)	
University of Stellenbosch (Stel)	
University of The Witwatersrand (WITS)	
University of Kwa-Zulu Natal (UKZN)	
Walter Sisulu University (Umtata)	
Other (Please Specify)	

19) Which year did you complete your Undergraduate medical studies

20) To your best knowledge how long did you spend on ophthalmology training at Undergraduate level?	
None	
Less than a Week	
1-2 Weeks	
3-4 Weeks	
More than 4 Weeks	

21) Any further post graduate qualification? Year of qualification	
No	
Yes, Please Specify	