

An evaluation of the public sector optometric service provided within the health districts in KwaZulu-Natal, South Africa



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Background: In South Africa, optometry has been traditionally positioned within the private sector. The situation has gradually changed over the past two decades, with optometry being introduced into the public sector in many parts of the country. Despite the growing numbers, optometrists are still new within the public health sector, motivating this study to evaluate the eye care services they provide.

Methods: A cross-sectional, retrospective, descriptive study was undertaken. Stratified random selection was applied to select the study sites, and systematic sampling was used to select patients' files. A saturated sample of public sector optometrists employed in the selected districts completed study questionnaires. Data were analysed using the Statistical Package for Social Sciences, Version 21.

Results: A total of 2968 records were reviewed, and gender distribution was 67.6% female and 32.4% male. Refraction (86.73%) was the most frequently conducted test, followed by ophthalmoscopy (74.73%), colour vision (0.07%) and gonioscopy (0.03%). The response rate for the questionnaires was 64.7%. Optometric outreach services were conducted by 54.5% of optometrists, and the majority (83.3%) reported that the farthest outreach facility was more than 50 km from their base hospital. The availability of equipment at outreach facilities was less as compared to base hospitals, while some reported not having the necessary equipment even at base hospitals. None of the optometrists did contact lens fitting at outreach facilities. A lack of equipment was cited as one of the reasons for not providing this service by 100% of optometrists. Most optometrists (63.6%) believed that more than 30% of their referrals might have been avoided if they had prescribed therapeutic agents to manage ocular conditions.

Conclusion: Introducing optometrists within the public sector improves access to services for rural communities. However, the minimum standard of optometric care is not practised, allegedly because of a lack of equipment. Therefore, resources should be made available to enable optometrists to provide comprehensive optometric services. In addition, the study highlighted the need for more optometry posts in rural communities and for the implementation of career growth paths to attract and retain optometrists within the public sector.

Introduction

The number of people suffering from visual impairment (VI) and blindness globally continues to rise, even though the World Health Organization (WHO) estimates that approximately 80% of VI can be prevented or cured.¹ The WHO further estimates that 253 million people are visually impaired worldwide, of whom 217 million are classified to have low vision (moderate and severe VI) and 36 million are classified as blind. The leading causes of low vision are uncorrected refractive errors (URE) (53%) and unoperated cataracts (25%). Unoperated cataracts (35%) and URE (21%) are also the leading causes of blindness. Although there has been a decrease in the prevalence of VI over the last 20 years, the WHO estimates that the number of people with VI could triple because of population growth and ageing.¹ It was previously estimated that 32.7 million of the world's visually impaired are in Africa.² A 2011 study³ conducted in rural South Africa identified cataracts and URE as the most common causes of VI and blindness among diabetic black South Africans aged 40 years and older. Naidoo et al.⁴ also identified refractive errors and cataracts as the leading causes of VI in a South African health district. Visual impairment may negatively impact the quality of life of the affected individuals as well as the economic productivity in developing countries such as South Africa. Most adults with severe VI

Note: Additional supporting information may be found in the online version of this article as Online Appendix 1: <https://doi.org/10.4102/aveh.v77i1.407-1> and Online Appendix 2: <https://doi.org/10.4102/aveh.v77i1.407-2>

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and blindness may be denied opportunities to actively participate in the mainstream economy, thus creating an added burden on their government to cater for their needs. Similarly, visually impaired children may be excluded from the education system as most developing countries do not have adequate facilities to cater for them. As a consequence of such exclusions, these children are likely to be dependent on social grants and handouts during their adult lives.

In the rural KwaZulu-Natal (KZN) province, cataracts were identified as one of the leading causes of blindness⁴ and have also been identified as one of the national health priorities.⁵ However, it appears that the country has difficulty in dealing with the burden of cataracts – a survey⁶ indicated that the cataract surgical ratio (CSR) in South Africa was 1226 cataract operations per million population per year, which was lower than both the originally targeted 2000 and the subsequent lowered value of 1500. An inappropriate use of surgeons' time on performing other non-surgical work is cited as one of the causes for not achieving the targeted CSR.

A survey by Statistics South Africa estimated the population of South Africa to be 55 653 646 and found that approximately 9.2% of the total population used eye glasses as a form of corrective device.⁷ The survey further indicated that 10.3% of the population have a seeing or sight disability, the highest of all forms of disabilities surveyed. The National Department of Health previously estimated the prevalence of blindness in the country to be 0.75%,⁸ while Naidoo et al.⁴ recently estimated a prevalence of 0.9%, with leading causes being cataracts, refractive errors and glaucoma.

Statistics by the Health Professions Council of South Africa (HPCSA) reveal that there are 3697 registered optometrists.⁹ On average, South Africa currently has an optometrist to patient ratio of 1:15 052. Comparatively, Australia, with 5313 registered optometrists¹⁰ and a population of 24 127 200,¹¹ has a ratio of 1:4541, which is one of the highest per capita ratios of optometrists in the world. The United States of America, meanwhile has an average ratio of approximately 1:7848.¹² The WHO recommends a minimum ratio of 1:100 000 for optometrists or refractionists and 1:250 000 for ophthalmologists.¹³ However, it remains questionable as to whether the application of these recommended ratios will be adequate to achieve the Vision 2020 targets. In developing nations like South Africa, however, because of the unequal distribution of optometrists between urban and rural areas, the ratios have to be calculated separately to obtain sensible data.¹⁴

Walls¹⁵ indicated that optometry has much to offer towards eye care services in government hospitals. Historically, in South Africa optometry has been a profession traditionally positioned within the private sector, with optometrists practicing primarily in solo, group or association practices. The situation has slowly changed over the past two decades, with optometry gradually being introduced into the public

health sector in many parts of the country. The accessibility to optometrists by patients utilising public health facilities is still poor when one considers that only 262 optometrists (Nxumalo F, personal communication, March 24, 2017) are employed by public health facilities to cater for the needs of 70.7% of the population utilising public services.¹⁶ This translates to a ratio of 1:150 179. In contrast, private optometrists serve the 28% of the population that utilise private facilities,¹⁵ resulting in a ratio of 1:4537. Despite the numbers of public sector optometrists increasing annually in certain provinces, provinces such as the Western Cape and Northern Cape still lag behind.

Although the number of public sector optometrists is still considered too low to meaningfully meet eye care needs, they are more than twice the 113 ophthalmologists (Nxumalo F, personal communication, March 24, 2017) employed within the public sector. This small number of ophthalmologists working within the public sector makes it virtually impossible for them to adequately deal with the high surgical demands as well as the non-surgical treatment and management of ocular diseases. The numerical advantage and further training in ocular diagnostic and therapeutic areas of optometrists make their inclusion in the restructured primary eye care system in South Africa crucial for the National Health Insurance (NHI) to succeed.¹⁷ Incorporating the new optometry scope into the eye care service delivery protocol would alleviate the workload burden on ophthalmologists.

Despite the increase in the number of optometrists and ophthalmologists employed in the public sector, it is still virtually inadequate to significantly reduce the prevalence of VI and blindness. In addition, of concern are the anecdotal reports indicating that even in facilities where optometrists are employed, they are not practising to their full scope. The number of optometry posts needed or the scope of practise requirements was not empirically determined prior to optometrists being introduced into the public sector. The post-apartheid eye care leadership presumably recognised that the public sector eye care services across the country were inadequate, with a common cause being the absence of public sector optometry posts. Hence, in an attempt to rectify this situation and address the issue of preventing avoidable blindness, provinces began creating public sector optometry posts without coherent strategies in place. The KZN province has created optometry posts for many years, but the impact that these employed optometrists are making on the eye care services within the public sector in KZN has not been evaluated. Hence, this study aimed to evaluate the services rendered by the optometrists towards informing the planning and development of future public sector optometric services.

Methodology

A cross-sectional, retrospective, descriptive study was undertaken. Stratified random selection was used to select the study sites (five hospitals) from the four selected

health districts, namely eThekweni, iLembe, Ugu and uMgungundlovu. The study population comprised patients who presented at optometry clinics in the five selected hospitals from January to December 2012, and public sector optometrists based at the four selected health districts in 2012.

Data collection tools comprised the following:

- A chart to capture data from the clinical record cards of patients examined at the selected hospitals from January to December 2012. Information captured on the chart included the patient's biographical data: chief complaint, test results, diagnosis and management. No names or personal identity information was recorded to maintain patient confidentiality (Online Appendix 1).
- Semi-structured questionnaires administered to optometrists. Questions on biographical information, their clinical roles and experiences as well as perceptions about the new expanded scope of optometry were included (Online Appendix 2).

Systematic sampling was used to select available patients' files from the selected hospitals. Clinical records of patients were reviewed and captured, and every captured record was coded to ensure anonymity.

The questionnaires were distributed to all public sector optometrists employed at the public health facilities in the chosen districts, and informed consent was obtained from all participating optometrists prior to the commencement of the research. All the participants were assured that confidentiality would be maintained and they were also made aware that their participation was voluntary.

Data with individual reference were captured on Microsoft Excel and transferred to the Statistical Package for Social Sciences (SPSS), Version 21, for further analysis.

Ethical considerations

Written permission to conduct this study was granted by all the relevant authorities from the Department of Health (KZN province), and ethical clearance to perform this study was obtained from the Humanities and Social Sciences Research Ethics Committee (HSSEC), University of KwaZulu-Natal, South Africa.

Results

Patients

Demographics

A total of 2968 files from the five selected hospitals were reviewed, of which the majority were female (67.6%) and 32.4% were male. The age range of the patients varied from 1 to 97 years, with a mean of 47.8 years and a standard deviation of 21.1 years. Of the patients, 14% were less than 18 years old and 70.5% were aged 40 years and older.

Reasons for consultation

Although some patients indicated more than one reason for consultation, reduced vision (82.0%) was mentioned as the most frequent reason, followed by complaints (20.2%) not stipulated on the data collection tool, referrals from other facilities (14.6%), routine eye examinations (6.7%), ocular pain (3.2%), ocular trauma (1.7%) and binocular vision-related complaints (1.4%).

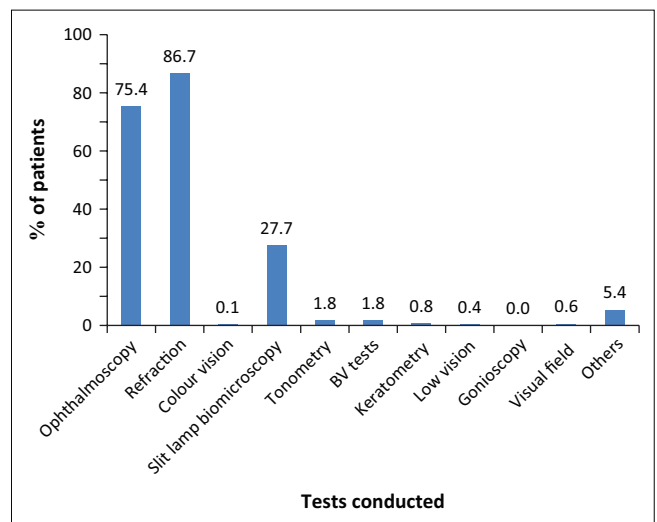
Tests conducted

The frequency of tests conducted is shown in Figure 1.

Diagnosis and management strategies employed

Refractive error (74.2%) was the most frequently diagnosed condition, followed by pathology (29.5%). The management strategies employed are shown in Figure 2.

A comprehensive distribution of all patients presenting with different chief complaints, their diagnosis and management is shown in Table 1.



BV, binocular vision.

FIGURE 1: The frequency of tests conducted on patients by optometrists.

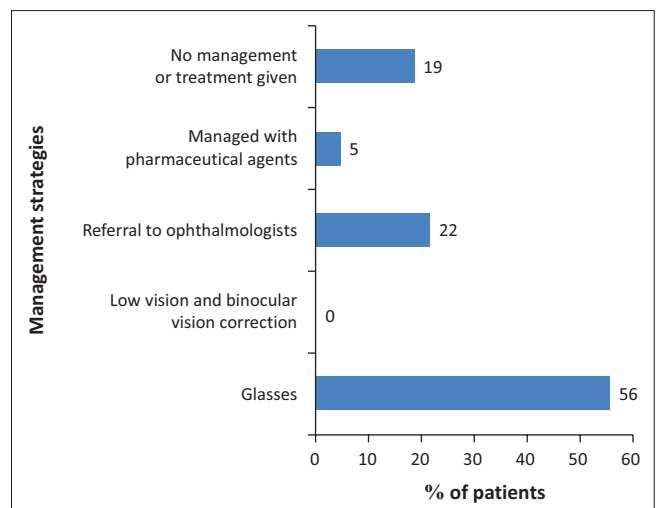


FIGURE 2: Management strategies (%) implemented for patients.

TABLE 1: Showing diagnosis and management of each of the presenting chief complaints.

Presenting chief complaints	Reduced vision		BV		Pain		Trauma		Routine examination		Referrals		Others	
	N (2435)	% (65.5)	N (43)	% (1.2)	N (96)	% (2.6)	N (49)	% (1.3)	N (60)	% (1.6)	N (432)	% (11.6)	N (601)	% (16.2)
Diagnosis														
Refractive error	2014	74.0	26	1.0	47	1.7	24	0.9	14	0.5	251	9.2	347	12.7
Pathology	657	54.8	7	0.6	50	4.2	20	1.7	6	0.5	191	15.9	268	22.3
BV anomaly	17	39.5	20	46.5	1	2.3	0	0.0	0	0.0	4	9.3	1	2.3
NAD	95	39.6	2	0.8	4	1.7	5	2.1	41	17.1	43	1.9	50	20.8
Management														
Spectacles	1555	77.2	16	0.8	29	1.4	16	0.8	8	0.4	155	7.7	235	11.7
LV correction	11	61.1	0	0.0	0	0.0	0	0.0	0	0.0	4	22.2	3	16.7
BV correction	4	50.0	3	37.5	0	0.0	0	0.0	0	0.0	0	0.0	1	12.5
Referred to ophthalmology	508	57.5	15	1.7	26	2.9	17	1.9	7	0.8	183	20.7	128	14.5
Pharmaceutical treatment recommended	85	38.5	3	1.4	18	8.1	5	2.3	0	0.0	25	11.3	85	38.5
Discharged without treatment	365	51.0	7	1.0	26	2.9	13	1.8	43	6.0	103	14.4	158	22.1

BV, binocular vision; LV, low vision; NAD, no abnormality detected.

Optometrists

Profile

The response rate for the optometrists' questionnaires was 64.7%. The majority (90.9%) of optometrists were younger than 30 years, with 81.8% being female and the rest (18.2%) male. The majority (54.5%) of the optometrists had less than 5 years post-qualification or registration (PQR) working experience, 9.1% had more than 20 years of PQR working experience, and the rest (36.4%) had PQR experience of between 5 and 10 years. Only 18.2% were based in rural areas, while 81.8% were based in urban and peri-urban areas. All the optometrists were employed at entry level optometry posts, with none of the study participants employed at the level of chief optometrist or higher. The duties were classified as either production (54.5%), which involves only doing clinical duties; or both production and supervisory (45.5%), where the optometrist does both clinical and managerial duties.

Outreach

Outreach services were conducted by the majority (54.5%) of optometrists. However, all the optometrists rendering outreach services were based in rural and semi-urban areas, with none of the urban-based optometrists rendering outreach services. The outreach services are conducted on a rotational basis, as different facilities are visited on different days of the week. The number of outreach facilities visited by each optometrist ranged from 3 to 10.

Distance to outreach facilities: A third (33.3%) of the optometrists who conducted outreach services reported that their nearest outreach facility was less than 10 km from their base hospital, while another third reported that the nearest facility was more than 50 km from their base hospital. Only 16.7% of the optometrists reported that the farthest outreach facility was less than 20 km away from their base hospital, while the rest (83.3%) indicated that the farthest outreach facility was more than 50 km away from their base hospital.

Number of patients seen per month at outreach facilities: A third (33.3%) of the optometrists reported that they examined less than 50 patients per month at their outreach facility, 50% reported that they examined between 50 and 200 patients and 16.7% reported that more than 200 patients were examined monthly.

Waiting period at outreach facilities: Half (50%) of the optometrists reported that the waiting period at their outreach facility was less than one month, while the other half reported that the waiting period at the outreach facility was between one and three months. The majority (66.7%) of the optometrists reported that subsequent to seeing patients, the referral waiting period from the outreach facility to their base hospital was less than one month, while the remainder had a waiting period of between one and six months.

Services provided at outreach facilities: The majority (83.3%) of the optometrists conducting outreach services reported that they did vision screening, refraction and the dispensing of spectacles at outreach facilities. Only 16.7% provided low vision assessments at outreach facilities. None of the optometrists reported doing any ocular diagnostic procedures, binocular vision and contact lenses at outreach facilities.

Reasons for not providing services: The reasons mentioned by the optometrists for optometric services not being provided at outreach facilities are shown in Figure 3.

Base hospitals

Number of patients seen at base hospitals: Two thirds (66.7%) of the optometrists reported that they examined more than 200 patients at their base hospital, and one-third (33.3%) reported that fewer than 50 patients were examined monthly at their base hospital.

Services provided: The majority (90.9%) of the optometrists reported performing refraction and low vision assessments, 81.8% reported also ordering and dispensing spectacles, 72.7% reported performing vision screening and ocular diagnostic

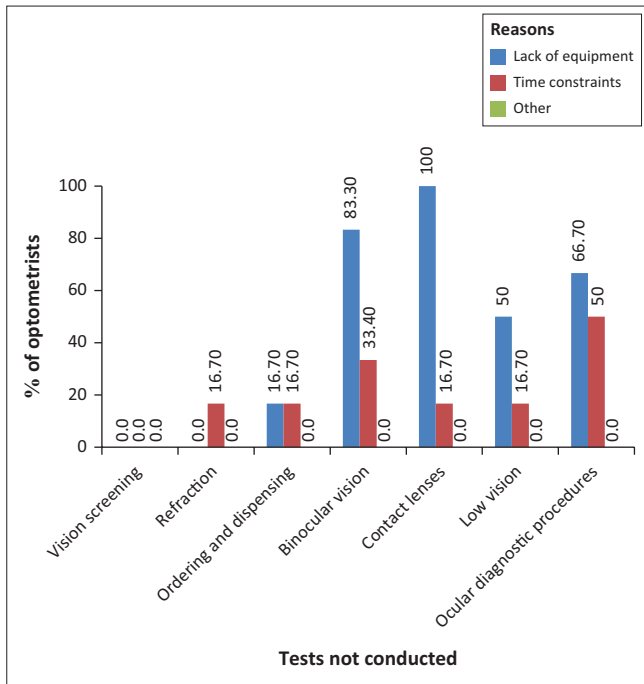


FIGURE 3: Reasons given by optometrists for services not provided at their outreach facility.

procedures, and 54.5% and 9.1% reported providing services relating to binocular vision and contact lenses, respectively.

Reasons for not providing services: The reasons mentioned by the optometrists for services not being provided at their base hospital are shown in Figure 4.

Referrals of patients by optometrists: The majority (90.9%) of the optometrists referred their patients to ophthalmologists at a frequency of more than once a week, whereas 27.3% and 18.2% referred to other health professionals and general practitioners, respectively, at the same frequency. In addition, 18.2% referred to private optometrists at a frequency of only once a week.

The conditions for which patients were most frequently referred more than once a week were as follows: 81.8% of the optometrists referred patients for crystalline lens conditions, 54.5% referred patients for glaucoma and 36.4% referred patients for retinal conditions and binocular vision or paediatric conditions.

Equipment: The availability of equipment is shown in Figure 5.

Optometry scope expansion to include ocular therapeutics

When asked about their opinion and knowledge of the recent optometry scope expansion to include ocular therapeutics, all the optometrists (100%) agreed that optometrists should be able to prescribe ocular therapeutic drugs for the treatment of anterior segment ocular diseases (ASOD), and 90.9% stated that optometrists were adequately trained to diagnose ASOD. Participating optometrists reported often recommending the appropriate medication to the consulting medical doctor when referring. In addition, all the optometrists indicated that they would wish to use drugs to treat ocular diseases

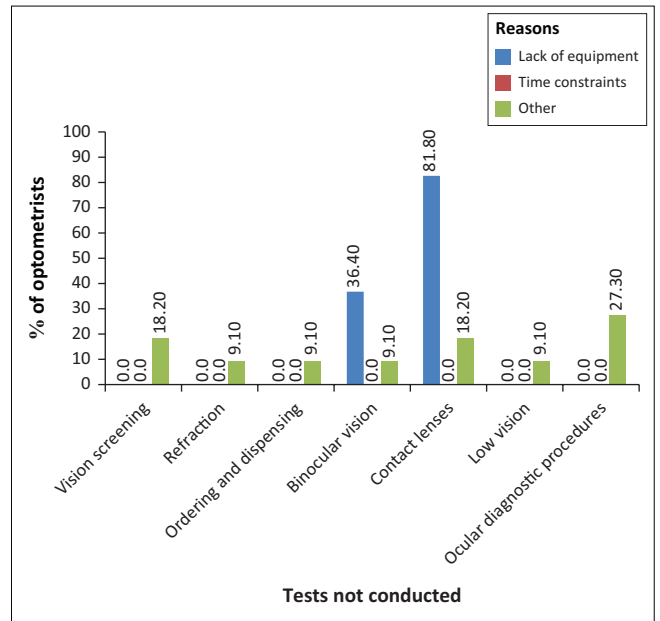
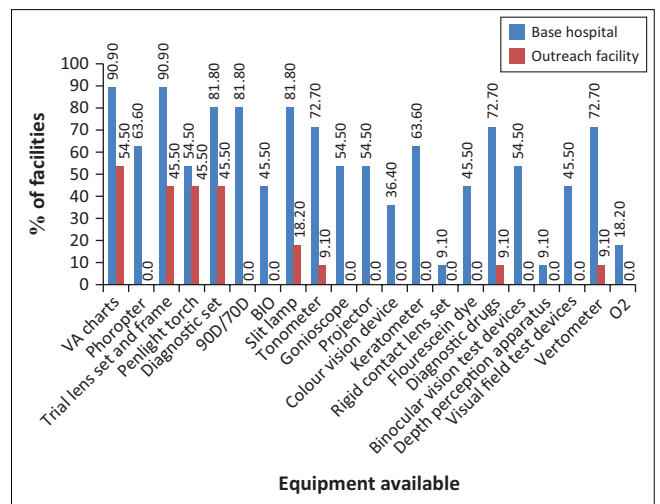


FIGURE 4: Reasons given by optometrists for services not provided at their base hospital.



VA, visual acuity chart; 90D/70D, 90 Diopter or 70 Diopter double aspheric fundus examination lens; BIO, binocular indirect ophthalmoscope; O2, any other optometry equipment or instrument not initially listed Online Appendix 2.

FIGURE 5: Availability of equipment at base hospitals and outreach facilities.

and that they would be interested in undertaking further training to allow them to prescribe such drugs.

Expected effect of ocular therapeutic agents prescription on referral rate

Approximately two thirds (63.6%) of the optometrists believed that more than 30% of their referrals might be avoided if they were allowed to prescribe therapeutic agents. The benefits of the scope expansion cited by optometrists are summarised as follows:

- reduced number of patient consultations or workload for ophthalmologists
- reduced costs to government, for example, transportation costs of referred patients
- improved access to eye health care services for patients
- early management of ocular conditions.

Discussion

Patients

Demographics of patients

Although the South African population is reported to have a median age of 20–29 years,¹⁸ this study revealed that the uptake of eye health services is low among this population group. This may have resulted from youth prioritising job seeking since unemployment is high among this population group,¹⁹ so seeking health care may not be their priority. There was also a low uptake of eye health services by those younger than 18 years. It is possible that this group may have already been attended to at school by the government school health services. However, as the visual demands in both education and the working environment are high, eye health care promotions that target children and young adults need to be performed to encourage the uptake of eye health services. Presbyopia as well as the visual impact of other systemic diseases affecting the eyes may have influenced a high percentage (70.5%) of older age groups (40 years and above) as global surveys indicate that the prevalence of diseases such as diabetes mellitus and hypertension increases with age.^{20,21}

The majority (67.6%) of patients identified in the study were female, as corroborated by the Statistics South Africa (2011) finding that, across all race groups, women are more likely than men to have visited a health worker.²² The same survey further revealed that a larger proportion of men than women rated their health as either 'good' or 'very good'. Presumably, males also rate their eye health as being good and do not see the need to visit an eye health facility. Eye health education can be included in campaigns or promotions targeting males, which can serve to encourage the utilisation of all health services available. Previous studies revealed that men have high mortality rates as compared to women.²³

Presenting complaints

Almost two-thirds of all presenting complaints was reduced vision, with a small proportion of subjects presenting to optometrists with ocular pain and ocular trauma. This could be because of the 'triage' or sorting system employed at public sector facilities, whereby nurses, as the first contact health care workers, screen and direct patients to the relevant eye care personnel or professionals. Patients reporting reduced vision or are suspected of having URE are more likely to be referred to an optometrist. Conversely, patients complaining of pain and trauma in the eyes are more likely to be directed to an ophthalmologist. In hospitals where optometrists work independently (without ophthalmologists or ophthalmic nurses), they would presumably be exposed to a variety of complaints as a result of having almost all eye conditions referred to them. In these instances, the optometrists have to manage most of the conditions falling within their scope of practice and refer others to ophthalmologists or other relevant health practitioners.

Tests

Optometrists frequently performed ophthalmoscopy and refractions, while other tests such as tonometry, colour vision, visual field, keratometry or binocular vision were conducted less frequently. However, the eliminated tests are part of the minimum tests required for a basic vision and eye health consultation, as defined by the HPCSA.²⁴ The cited lack of equipment and time constraints must be addressed by health care facilities to ensure that public sector patients receive the minimum expected standard of clinical care. This will also contribute to practitioner job satisfaction. The lack of equipment and infrastructure was mentioned in a previous study by public sector optometrists as one of the priorities that needed intervention for retention purposes.²⁵

Diagnosis

A high number of patients seen by optometrists presented with complaints of reduced vision and were refracted and diagnosed with refractive errors. Notably, almost one-third (32.6%) of subjects who presented with complaints of reduced vision were also diagnosed with pathological conditions, suggesting that some pathological conditions presented with refractive errors which patients may have presumed were the only problem at the time of going to an eye health facility. This further emphasises the important role of optometrists in the identification and management of other pathological conditions of the eye. While attending to refractive conditions, they may diagnose sight or life-threatening conditions that require appropriate referrals, for example, glaucoma and tumours such as retinoblastoma. With the increasing prevalence of diabetes²⁰ and hypertension²¹ in countries like South Africa, these systemic conditions may lead to ocular conditions such as retinopathy and secondary glaucoma; optometrists need to ensure that tonometry, visual fields and dilated fundus examinations are conducted on all patients as part of the normal optometric standard of care. The lack of contact lens services at public sector facilities means that keratoconic patients may not be adequately managed, potentially resulting in academic exclusion for scholars and the loss of income or work opportunities in adults. It is therefore important for health authorities to consider including contact lens care as well as other important eye health care services such as binocular vision.

Optometrists

Demographics of optometrists

It is encouraging to note that many young optometrists are selecting to work within the public sector – 90.1% of the participants were younger than 30 years of age. This is good for the public sector as these optometrists still have many working years to contribute before retirement, and hence, an investment in their development for the long-term benefit of the country should be considered. Of note, however, is that experienced practitioners do not work in semi-urban or rural areas. Ideally, there should be a mix of experience in all areas of practice.

More than three-quarters of optometrists were female, despite a 2006 student study²⁶ suggesting that males were more than twice as likely to prefer work in a hospital as females when asked about the kind of practice they would join upon completion. The study also revealed that females were more risk averse than males since they showed less likelihood of opening their own practices. Hence, a possible reason why there is a higher representation of females than males in the study is because females may consider public sector hospital employment as a less risky option. It is also possible that the high representation of females could be related to a higher enrolment of females at optometry training institutions.²⁷

Area of practice

Few of the optometrists were based in rural areas, with the majority located in urban and semi-urban areas. This means that most of them are catering for communities that are more likely to already have access to private optometric services, even though it is acknowledged that some may be financially excluded from accessing urban-based private practices. However, the levels of poverty are far higher in rural areas, making more people dependent upon public sector facilities for eye health care. With the population in KZN being almost equal in rural and urban areas, it is recommended that the numbers of optometrists serving them should, at the least, be evenly distributed to increase access in these underserved areas. The impact of poor access was highlighted in a previous study which suggested that the lack of access to refractive services may have been one of the reasons for the low uptake of spectacles in semi-rural and rural populations.⁴ Therefore, increasing access to optometrists will improve the use of eye services. This was found in a study conducted to evaluate the impact of eye health care services delivered in rural communities of the Mankweng area in Limpopo, where there was a high utilisation (85.9%) of optometric services by patients seeking eye health care services.²⁸ The availability of affordable optometry services from the University of Limpopo Optometry Clinic may have contributed to an improved access to eye health care services for these communities since they are located adjacent to the university. Accordingly, there is a need for stakeholders to come together to provide rural communities with affordable services in their vicinity, which may lead to improved access and utilisation of eye care services.

None of the optometrists interviewed were employed at the level of chief optometrist or higher, possibly highlighting a lack of career growth opportunities for optometrists in the public sector. A concern is that this phenomenon may eventually lead to a loss of skills to the private sector to the detriment of eye health care services for the majority of the population dependent on the public sector. Ramson et al.²⁵ ranked career growth as the second highest required intervention stated by public sector optometrists when asked about their potential retention within the public service. Therefore, there is a need for career growth opportunities and improved working and living conditions

for optometrists if retention and recruitment strategies are to succeed.²⁷

Outreach

The majority (54.5%) of optometrists reported that they conduct outreach services on a rotational basis to health facilities that do not have optometric services. Initiatives such as these improve access to optometry services for communities residing in the outlying areas of their districts. This study, however, highlighted that not all basic optometric services were provided during community outreach programs. The main reasons for not providing all optometric services seem to be a lack of equipment at these facilities and time constraints. Although the care at base hospitals is also not optimal, patients attending these outreach facilities are being deprived of the standard of care that patients at base hospitals receive, raising serious ethical concerns. There is a need to adequately equip these facilities to enable optometrists to conduct comprehensive eye examinations. Comprehensive needs assessments must be undertaken to consider whether outreach facilities should have full-time optometrists, as this study revealed that some facilities have a waiting period of more than a month. Time constraints was not mentioned as a reason for not providing comprehensive services at base hospitals, yet was mentioned several times as a reason for not providing some of the services at outreach facilities. This may suggest that the time spent travelling to outreach facilities may hamper the provision of comprehensive services to patients, further supporting the need to assess whether full-time or more frequent eye health care services at outreach facilities is indicated. This will address population coverage, one of the three dimensions identified by the WHO for progressing towards universal health coverage for member states, as South Africa proceeds with the introduction of the NHI. One of the goals for the NHI under population coverage is to extend health care coverage to all South Africans, ensuring that populations that are in the greatest need and those experiencing the greatest difficulty in obtaining health care are prioritised.¹⁷ Therefore, communities in remote and rural areas should be prioritised by having eye health care services closer to where they live.

Referrals

It has also been noted that crystalline lens conditions were the most frequently referred condition, exacerbating the cataract backlog. Glaucoma was the second most frequently referred condition. In other parts of the world, optometrists diagnose and manage glaucoma patients²⁹ which, if implemented in South Africa, may significantly enhance patient care as many of these optometrists visit areas that currently do not have any access to an ophthalmologist. Without access to eye health care services for glaucoma patients, the number of patients affected by preventable blindness will continue to rise. The recent scope expansion for optometrists to prescribe therapeutic drugs and to manage glaucoma presents an opportunity for South Africa to utilise optometrists to manage or co-manage such conditions and release ophthalmologists to focus on the cataract backlogs and other surgical and advanced ophthalmic conditions.

Other anterior segment and retinal conditions were the third most frequently referred condition. Utilising optometrists in the management or co-management of some of the anterior segment conditions may result in a reduction of long delays currently experienced by patients who are referred to ophthalmologists. Treating or managing patients closer to where they live will also reduce costs to the state for transporting patients, as well as reducing the loss of work hours for employed patients. This study thus promotes a collaboration between optometrists and ophthalmologists in the KZN province and in making strides in providing these historically underserved populations with eye health care services that are of a high quality, as well as being accessible and cost-effective.

Almost a quarter of the subjects in a previous study cited finance as the reason for not seeking eye health care services, despite the study being conducted in communities that lived within a 10 km radius of eye health care facilities.²⁸ Finance for transport may therefore not be the only factor for those patients in this study who live more than 50 km away from optometric facilities. The financial difficulty may include the costs of the optical device. Provincial eye health care models should include financial structures that make the provision of optical appliances affordable to patients. Cost-effective access to optometric services must also be accompanied by eye health promotion initiatives within communities. These initiatives must educate the public on the importance of having eye health examinations and advice on where to locate eye health facilities that are close to communities.

Services

Patients diagnosed with common, minor anterior segment conditions such as blepharitis or conjunctivitis were managed by medical doctors or referred for treatment. However, optometrists are very capable of managing these minor pathological conditions without having to refer to the already overburdened medical doctors at the respective facilities. This is corroborated by records which revealed that 5% of all cases were managed by optometrists in the form of appropriate ocular pharmaceutical treatment recommended to the medical doctor. Some optometrists felt that more than 30% of their referrals could be reduced if they were permitted to use drugs to treat some ocular diseases; consequently, this may reduce the workload of ophthalmologists and ophthalmic medical officers. Optometrists also indicated their willingness to undertake further training in order to improve their existing scope and supported continuous learning to keep themselves abreast of changes in their profession.

Conclusion

This study highlights the improved access to eye health care services achieved through the inclusion of optometrists into the human resource structure within the public sector. Many historically underserved rural communities have, for the first time, access to eye health care services. However, the concern is that the regulated minimum standard of

optometric care is not being provided, primarily because of a lack of equipment and cited time constraints. In addition, the optometrists who are appropriately trained are underutilised when one compares the full professional scope with current practices at the facilities examined in this study. Public sector patients seeking care at these facilities are therefore deprived of the comprehensive eye health care services that optometrists are expected to provide. There is a moral and ethical obligation to ensure that these patients, who generally cannot afford to visit private optometrists, receive the minimum standard of eye health care services as defined by the regulatory authority. Therefore, there is a need for relevant stakeholders to develop strategies to improve the quality of eye health care services in this sector.

This study recommends that government allocates appropriate resources to optimise the services that optometrists can provide within the public sector. It is evident that if public sector optometrists were given more training and resources, they could significantly contribute to reducing the referral rate of patients, thus reducing the costs of service delivery to government and bringing services closer to where patients reside.

Appropriate strategies, advocacy and political will are needed to create more optometry posts in rural communities, with the implementation of career growth paths and support systems to attract and retain optometrists. The various stakeholders in eye health care, such as government, institutions of higher learning, regulatory bodies, professional associations, and industry and non-governmental organisations, should collaborate to ensure that eye health care services improve in accessibility, quality and cost-effectiveness.

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Competing interests

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Authors' contributions

M.E.M. was responsible for the study design, data collection, analysis and writing of the article. V.R.M. supervised the project and also contributed to the writing of the article.

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