

# Evaluating Eye Care Services in South Africa's Limpopo Province Using Donabedian's Framework: Insights into Structures, Processes, and Outcomes

Hlabje Carel Masemola<sup>1</sup>, Olivia Baloyi<sup>1</sup>, Zamadonda Nokuthula Xulu-Kasaba<sup>2</sup>

<sup>1</sup>Department of Public Health Medicine, School of Nursing and Public Health, University of KwaZulu-Natal, Durban, South Africa; <sup>2</sup>Department of Optometry, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa

Correspondence: Hlabje Carel Masemola, Department of Public Health Medicine, School of Nursing and Public Health, University of KwaZulu-Natal, Durban, 4041, South Africa, Email Masemolahc@gmail.com

**Purpose:** Eye care services play an essential role in public health by addressing the needs of millions impacted by visual impairment and blindness annually. This study aimed to assess eye care services in Limpopo Province through Donabedian's framework, focusing on evaluating the availability and sufficiency of eye care infrastructure (structure), service delivery effectiveness (process), and patient outcomes.

**Methods:** Using an exploratory, descriptive qualitative design, data were gathered in June and July 2024, through in-depth individual interviews. Ten (10) district eye health coordinators were selected as participants using purposive sampling. Data were thematically analyzed with NVivo version 12, revealing three main themes: resources and organizational setup, service delivery and healthcare interactions, and results of care provided.

**Results:** The findings revealed the first theme as resources and organizational setup with sub-themes such as availability of eye care, services, resource allocation and, infrastructure, human resources and staffing. The second theme was service delivery and healthcare interactions with sub-themes such as service delivery and quality, perception, referral systems and inter-hospital coordination, health promotion and community outreach. The third theme was results of care provided with patient outcomes and satisfaction, technological advancements and patient care, challenges in achieving and public health goals as sub-themes. The findings indicate that challenges related to structure and processes significantly influence patient outcomes.

**Conclusion:** The study further highlights resources, service delivery efficiency, and referral timeliness as key factors essential for achieving optimal patient outcomes and contributing to the broader objective of universal eye health coverage.

**Keywords:** eye care services, donabedian's framework, visual impairment, service delivery, patient outcomes, South Africa

## Introduction

Public health relies heavily on eye care services to meet the requirements of the millions of people who are blind and visually impaired each year.<sup>1-3</sup> An alarming statistic by the World Health Organization (WHO) highlights that 2.2 billion people globally have vision impairment (VI), with nearly half of these cases being preventable or undertreated.<sup>4</sup> In Sub-Saharan Africa, similar patterns are observed where preventable blindness is predominantly caused by cataracts, glaucoma, and uncorrected refractive errors (URE).<sup>5</sup> This region has a high rate of blindness, with URE responsible for 48.5% of moderate to severe VI and cataracts for 40.1% of cases.<sup>6</sup> Inadequate resources, governance challenges, and limited access to healthcare are some of the factors causing this problem.<sup>7,8</sup> Access to timely interventions, such as cataract surgeries or refractive error correction through spectacles, remains limited, especially in rural areas like Limpopo Province. The cataract surgical rate in South Africa is below the WHO target of 2000 surgeries per million people annually, primarily due to various systemic barriers such as costs.<sup>9,10</sup> In Limpopo Province, this figure is even lower,

exacerbated by a lack of comprehensive awareness programs, insufficient ophthalmic resources, and geographical location of the surgical centres and limited availability of services.<sup>11,12</sup> Our findings, using Donabedian's Framework, build on the findings of these previous studies by providing a deeper understanding of how these structural and systemic challenges impact the quality of eye care services in the province.

International organizations such as the WHO and the International Agency for the Prevention of Blindness (IAPB) had advocated for the inclusion of eye care in universal health coverage (UHC), due to the prevalence of untreated eye disorders worldwide. The first Political Declaration on UHC, which recognizes eye health as a pivotal factor in health care, upholds the commitment to improve ocular health.<sup>13</sup> Furthermore, the 74th World Health Assembly further highlighted this, adopting additional goals for 2030: a 30% increase in the coverage of cataract surgery and a 40% increase in the effective coverage of refractive error.<sup>14</sup> These global initiatives highlight the need for South Africa, and particularly Limpopo Province, to prioritize eye care services within the UHC framework. National policies, such as the South African National Department of Health Strategic Plan for the Prevention and Control of Non-Communicable Diseases (NCDs) should aim to address these challenges by prioritising prevention and control of NCDs.<sup>15</sup> The integration of eye care into these policies, driven by global initiatives like the WHO's "World Report on Vision", emphasizes the need for comprehensive, people-centred care.<sup>4</sup> According to the World Report on Vision, countries should evaluate their unmet and met needs for eye care, support preventative and rehabilitative programs, and make sure priority initiatives have adequate funding.<sup>4</sup> To enhance eye health as part of UHC and support SDG 3 on Good Health and Well-Being and SDG 17 on collaborations for the Goals, this study aligns with international collaborations, such as the partnership between the WHO, IAPB, and local government.

In South Africa, the prevalence of VI and blindness is a significant public health concern, with varying rates across different districts and communities.<sup>5,11,16,17</sup> The potential of an ophthalmic health system strengthening (HSS) package to improve service delivery is highlighted by the evaluation of primary eye care services in South Africa.<sup>18</sup> A study by Majid further concluded that collaboration can overcome significant barriers in the provision of eye health care, especially through public-private partnerships (PPPs).<sup>18</sup> Achieving universal health coverage (UHC) also depends on the district health system's (DHS) governance structures, which promote improved accountability and resource allocation.<sup>19</sup> According to Malakoane et al (2023), the inclusion of community leaders in health initiatives contributes to the efficacy of HSS interventions.<sup>20</sup> Very little is known about the status of eye care services to support UHC. Evaluating eye care services in the Limpopo Province of Limpopo is essential for identifying shortcomings in infrastructure, outcomes, and service delivery. Access to high-quality eye care remains a challenge in rural areas like Limpopo Province, despite the growing understanding of its significance in public health. These include a lack of funding for the required interventions, a lack of human resources such as ophthalmic nurses, optometrists and ophthalmologists, and inadequate infrastructure in 37 health establishments rendering eye care services. Furthermore, the unique difficulties encountered in rural provinces such as Limpopo have not been sufficiently covered by previous South African studies, resulting in a knowledge gap that impedes efficient policymaking and resource distribution.

The evaluation of eye care services using Donabedian's framework can yield significant insights into the quality of care by examining the structure, process, and outcomes provided in Limpopo Province. Donabedian's framework is widely used in healthcare evaluations, focusing on three essential components: structure, process, and outcomes.<sup>21</sup> The structure refers to the physical and organizational infrastructure necessary for delivering care, such as clinics, equipment, and human resources. The process involves the interactions between healthcare providers and patients, including diagnosis, treatment, and follow-up care. Finally, outcomes measure the effectiveness of the care delivered, including improvements in health status, patient satisfaction, and reduction in the burden of disease. Donabedian's framework has been applied in various healthcare settings globally to assess the quality of services.<sup>22,23</sup> In eye care, it can help evaluate whether the available infrastructure in Limpopo Province is sufficient to meet the population's needs, the effectiveness of service delivery processes, and the impact of these services on patient outcomes. This can ultimately help inform policy and service delivery improvements.

Applying this model to eye care in Limpopo Province will help identify weaknesses and opportunities for improvement in the quality of services offered. In South Africa, the provision of eye care, particularly in underserved regions such as Limpopo Province with over 80% of the population living in rural areas, is crucial to reducing preventable

blindness and improving the quality of life.<sup>24</sup> In South Africa, primary eye care is predominantly provided at the district hospital level, but if need arises, patients are referred to higher-level institutions. The evaluation of eye care services in Limpopo Province considers broader systemic challenges within the South African healthcare system. This study aims to evaluate eye care services in Limpopo using Donabedian's framework. The objectives include assessing the availability and adequacy of eye care infrastructure (structure), the effectiveness of service delivery (process), and patient measures (outcome). Understanding these elements, the study seeks to contribute to the ongoing efforts to improve eye care services in rural and underserved areas, align with UHC goals, and inform the development of an eye health promotion intervention framework within a primary health care setting.

## Methods

### Study Design

This study adopted an exploratory sequential mixed-methods design, and this article focuses on the qualitative findings of the investigation utilising an explorative-descriptive approach to gain an in-depth understanding of participants' perspectives and experiences. Conducted in Limpopo Province, a rural region of South Africa, this study focused on eye health services within the District Health System (DHS), encompassing district, regional, and tertiary hospitals. These settings were chosen as all five districts offer optometry services across 37 hospitals, each with district coordinators dedicated to overseeing eye care services.

### Participant Selection

The study's target population included ten eye health district coordinators (n=10) from the five districts of Limpopo Province purposefully selected to represent the five districts of the province, with each district having two coordinators responsible for organizing, managing and coordinating eye care services, ensuring comprehensive insights from all districts. A non-probability purposive sampling method was applied; selecting participants based on their expertise and perceived knowledge of the topic.<sup>25</sup> By engaging district eye health coordinators, employed by the Limpopo Department of Health, the researcher aimed to capture a rich description of their understanding on the status of eye care in the Province. Inclusion criteria required participants to be employed by the Limpopo Department of Health, be a senior, chief or deputy director optometrist in the department, be tasked with oversight of eye care services in a district, and state a willingness to provide informed consent. Eye health professionals not holding district-level positions and not senior optometrists, on vacation or sick leave, and those working in the private and academic sectors were excluded from the study, in addition to those not consenting to participate.

### Ethical Considerations

This study followed the Helsinki Declaration's guidelines, ensuring voluntary participation, confidentiality during data collection, and transparent reporting.<sup>26</sup> Ethical approvals were obtained from both the Biomedical Research Ethics Committee at the University of KwaZulu-Natal (BREC/00006067/2023) and the Limpopo Department of Health Ethics Committee (LP\_2024-03-010). Additionally, institutional approvals were sought from the healthcare facilities involved in the study. By the Protection of Personal Information Act (POPIA), written informed consent was obtained from participants, and only essential personal information was collected. The informed consent agreement also encompassed the publication of responses in an anonymized form.

### Data Collection

Data were collected through semi-structured, face-to-face interviews, from June to July 2024. An interview guide was used to steer discussions, with the sessions recorded via a digital recorder. The interview guide design was informed by the Donabedian Framework by providing a systematic approach to exploring the quality of eye care services and questions were developed to align with its three domains. Before the main data collection, the interview guide was piloted with two optometry coordinators from KwaZulu-Natal to test its clarity and alignment with the research

questions. Following the pilot, the interview guide was adjusted based on feedback from the participants and in collaboration with other authors.

## Recruitment of Participants

After obtaining ethical clearance from the relevant institutions, the researcher met with the provincial coordinator to outline the study's objectives, significance, and ethical considerations. This initial meeting allowed the provincial coordinator to ask questions and clarify any uncertainties. The coordinator then shared information about the study with potential participants, who indicated their willingness to participate by providing their contact details. Prospective participants were sent an information sheet and consent form via email, and given time to consider voluntary participation. Interviews were scheduled at a convenient time for each participant, with contact information for the researcher and supervisors provided for any further queries.

## During the Interview Sessions

Each interview began with an introduction from the researcher, who reiterated the purpose of the study and obtained written consent from participants. Interviews were conducted in English, although participants could use their home language if preferred; all ten participants ultimately chose English. Confidential demographic information was collected before recording began to ensure anonymity. Open-ended questions guided the conversation, with field notes taken to capture additional details. Each session was held in a private room to maintain confidentiality, free from interruptions or noise. Interviews lasted between 18 and 35 minutes and were conducted by the first author, who holds an honours degree in psychology and a master's degree in public health, with qualitative data collection experience.

## Data Analysis

This study used Elo and Kyngäs's (2008) content analysis approach, a structured method involving preparation, organization, and reporting phases.<sup>27</sup> Audio recordings of the interviews were transcribed verbatim by a qualified language practitioner, and thematic saturation was confirmed by field notes.<sup>27</sup> During the preparation phase, the research team familiarized themselves with the transcripts. The organizing phase involved open descriptive coding, grouping these into categories and higher-order themes. Finally, in the reporting phase, categories and subcategories were presented with supporting quotes. The data were managed using NVivo version 12 for coding text and generating categories. The initial coding was validated through peer review, with a supervisor acting as a second coder. Codes were organized into themes in a second coding phase, where inter-coder reliability checks were conducted for credibility. The principal investigator compiled and interpreted themes into meaningful insights, grouping related codes and patterns to achieve a deep understanding of the data. All documents, including transcripts, were securely stored and organized for future reference.

## Trustworthiness

Trustworthiness was established following Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability.<sup>28</sup> Credibility was supported by prolonged engagement with participants to capture a nuanced understanding of their experiences and by conducting a pilot study to refine the interview guide.<sup>29</sup> To ensure transferability, thick descriptions were provided to convey behaviours and emotions within context. Dependability was maintained through an audit trail documenting every research step from inception to reporting. Inter-coder reliability checks were performed, with a supervisor acting as an adjunct coder to review codes and themes.<sup>29</sup> This collaborative coding approach minimized bias and reinforced the reliability of findings, while the audit trail enhanced transparency throughout the research process.

## Results

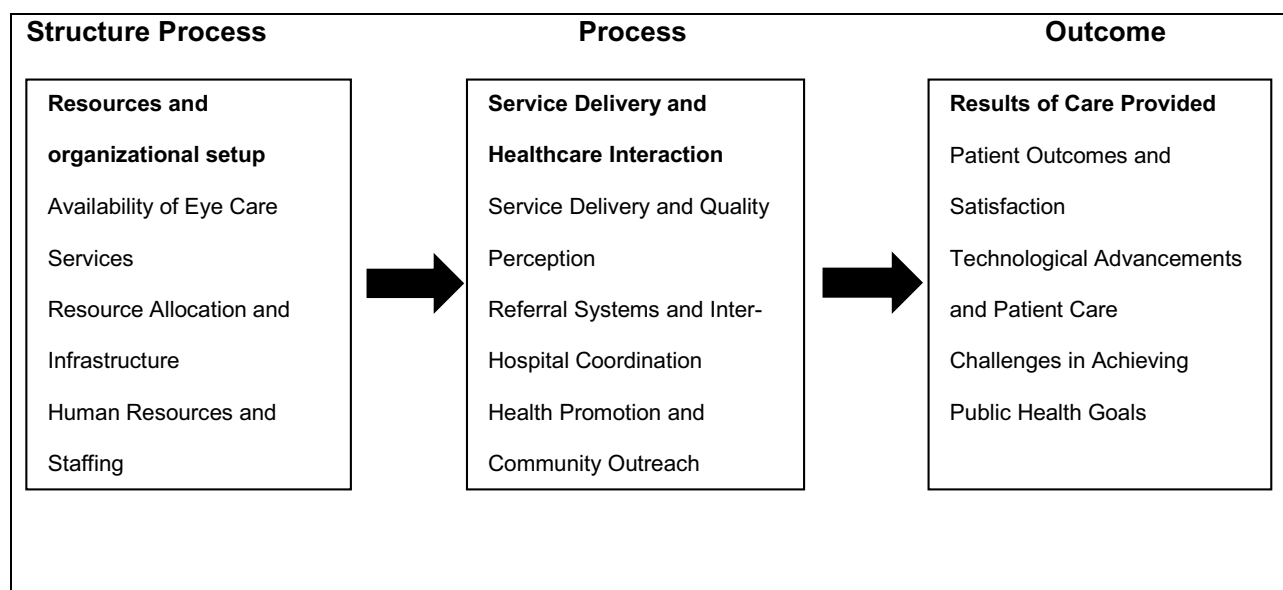
The study sample consisted of ten females (n=10) aged 31 to 60, predominantly in the 41–50 age group (Table 1). The marital status included married and single. Regarding academic qualifications, participants held advanced degrees in optometry, including Bachelor's and Master's degrees, as well as Post-Graduate Diplomas. The years of professional experience in the public sector for the participants varied from 6 to over 21 years. Their roles within the optometry field

**Table 1** Characteristics of Participants (N=10)

Characteristics	Sample
Age	
31–40	2
41–50	7
51–60	1
Gender	
Female	10
Male	0
Marital Status	
Married	5
Single	5
Highest Qualification	
Bachelor of Optometry	6
Post-Graduate Diploma	2
Master of Optometry	2
Years in the Public Sector	
6–10	1
11–15	1
15–20	4
>21	4
Professional Role	
Senior Optometrist (SO)	4
Chief Optometrist (CO)	2
Assistant Director Optometry (AD)	4

were primarily senior-level, including positions such as Senior Optometrist, Chief Optometrist, and Assistant Director, reflecting extensive expertise and leadership in their respective areas.

Three themes were identified centralised within the structure, process and outcome of Donabedian's framework: "Resources and organizational setup" "Service Delivery and Healthcare Interaction" and "Results of Care Provided", which reflect the interconnectedness of resources, service delivery, and patient outcomes, as described by the participants. Figure 1 shows the identified themes and sub-themes.

**Figure 1** Themes and sub-themes identified on the status of eye care.

## Resources and Organizational Setup (Structure)

### Availability of Eye Care Services

In general, participants agreed that eye care services are available in most hospitals across the province. There is at least one optometrist in every district hospital, and some have both optometrists and ophthalmic nurses. However, the availability of equipment and resources varied as per participants' verbatim transcriptions below:

There are challenges here and there, and on a scale of 1–10 I would say we are at 7 because we have optometrists in almost all the hospitals..., P1\_F\_AD

Our main issue will be lack of resources, lack of equipment, lack of buildings, yah, but we are trying to do our best to improvise to keep the profession going. P5\_F\_AD

Furthermore, participants also reported on the availability of eye clinics and optometry sections in regional and tertiary hospitals. This was in addition to outreach services which according to them extended to primary healthcare facilities. Below is what they said in their own words:

There is at least one optometrist in each hospital. In other hospitals, we are fortunate that we have ophthalmic nurses and optometrists. P4\_F\_CO

...We have 37 hospitals that have got optometry services, with optometrists working in those hospitals. P3\_F\_AD

### Resource Allocation and Infrastructure

Issues with resources, particularly those related to allocation of infrastructure and equipment, were consistently highlighted. Most participants pointed out that despite the availability of services; they are compromised by the lack of appropriate resources which is secondary to misaligned/maldistribution of resource and infrastructure allocation. This implies that even though there are eye care services available in many hospitals, resource allocation and infrastructure needs to be improved to guarantee consistent and high-quality care. The following quotes depicts these findings:

Our main issue will be lack of resources, lack of equipment, lack of buildings, yah, which is mainly because of unfair distribution of resources... P5\_F\_AD

The problem is further management where we don't have a lot of equipment. P3\_F\_AD

Echoing, the above participant, some of the participants had this to say not only about insufficient and outdated resources, but also on how these impacts negatively on patients care because of prolonged waiting periods for spectacles and eye surgeries.

"We are doing well... at least services are rendered", but there are still gaps in service provision, especially regarding the availability of specialized care and up-to-date equipment: "Some hospitals... don't have up-to-date equipment but basic equipment is there to examine and treat" P1\_F\_AD

There are a lot of patients waiting for cataract removal and other stuff, like pterygium. So, it takes time for pathology patients to get help. P9\_F\_SO

Furthermore, participants reported that there were inconsistencies in the provision of spectacles, influenced by procurement issues. Below is how they expressing these inconsistencies:

The problem is the deliverance of spectacles... sometimes it takes time for us to be able to give our patients spectacles, and then to also wait for lenses for a long period of time. P9\_F\_SO

It's seasonal when it comes to issue of issuing spectacles. Sometimes we have, depending on the tender or the procurement system, sometimes we don't have, but there is always something in place. P1\_F\_AD

## Human Resources and Staffing

The shortage of specialized staff, particularly ophthalmic nurses, opticians and ophthalmologists, was a recurring concern. Participants observed a trend in the declining number of ophthalmic nurses, with some hospitals relying solely on optometrists. This lack of human resources impacts the overall quality of care, especially for more complex eye health needs where patients need to wait a much longer period to receive specialised services. Quotes by some of the participants relating to human resource and staffing are as follows:

Like the trend now... ophthalmic nurses are decreasing in number. P2\_F\_AD

Currently in the province we have got three hospitals that are offering ophthalmology services, which are in three districts. So, depending on where the patient is, then they are referred to one of the three. P3\_F\_AD

There are a lot of patients waiting for cataract removal and other stuff, like pterygium. So, it takes time for pathology patients to get help. P9\_F\_SO

## Service Delivery and Healthcare Interaction (Process)

### Service Delivery and Quality Perception

Participants reported mixed perceptions about service delivery, noting both commendable aspects and areas needing improvement. Some described the services as “fifty-fifty”, especially regarding the provision of spectacles and surgical interventions.

For me service delivery is 50/50... like I mean there are good aspects and those which needs improvements... like “things are going well, but there are just some areas where I think there are services that are not going smoothly because us being the primary eye care givers sometimes we get stuck when it comes to the backlog of patients”. P7\_F\_SO

Others pointed out inconsistencies, such as delays in spectacles and cataract surgeries. This is how participants verbalized this

Patients often do not receive spectacles as soon as they should... while some wait longer for cataract operations campaigns. P6\_F\_SO

### Referral Systems and Inter-Hospital Coordination

The referral system plays a critical role in ensuring that patients receive the appropriate care. Participants use an upward referral system where patients are referred from clinics to district, regional, and tertiary hospitals. However, the system is not without challenges. Participants frequently highlighted delays in the referral processes and the time patients must wait for further medical interventions were frequently mentioned as barriers to effective care.

A district hospital gives support to clinics, then a regional hospital gives support to district, then tertiary gives support to regional. P3\_F\_AD

So, I was saying it's a 50/50 because sometimes our patients, when we refer them for further intervention, they are given delayed or prolonged time. P3\_F\_AD

### Health Promotion and Community Outreach

While some outreach programs have been effective, particularly before the COVID-19 pandemic. Some participants also noted a decline in service quality after the COVID-19 pandemic, particularly in school outreach programs. It has been reported that, before the pandemic, these programs were regularly conducted, well-organized however; post-pandemic challenges have led to fewer outreach initiatives with participants noting a lack of clarity in responsibility for school outreach programs between Health and Education departments.

Before Covid we were doing much better, then after Covid it's going down the drain, we are no longer doing school outreach the way we have been doing before Covid. I think schools have been neglected, especially the high school ones have been neglected... P6\_F\_SO

Participants indicated that they also engage in screening and health promotion efforts extend to primary care settings and school outreach programs, with added support from community radio stations. This platform enables healthcare providers to address public inquiries, raise awareness, and inform the community about available eye health services.

We also involve our community radio stations where we are able to answer a lot of questions and also make people aware of services. P5\_F\_AD

I would say at this moment, maybe in terms of primary healthcare we are trying, we are doing good, we are screening our patients. P2\_F\_AD

## Results of Care Provided (Outcomes)

### Patient Outcomes and Satisfaction

The participants indicated that patient satisfaction with services varied, yet again they perceived it as evenly split often dependent on the timeliness and efficiency of care. While some patients are perceived to be content with the services provided, others are discouraged by long wait times and limited access to specialized treatments. The delays in cataract surgeries and the prolonged wait for spectacles further influenced patient outcomes negatively.

It's 50/50... some patients come back happy because they've gotten the help they expected, others lose hope. P4\_F\_CO

...However some are often not very impressed because of long waiting periods for surgeries and spectacles. P1\_F\_AD

Participants highlighted the fulfilment that comes from reaching underserved communities and improving their vision. The improvement in vision is also linked to academic performance, as reported by participants, which leads to positive influence in their lives.

Many people who are very delighted after they get the operation because now they can see again, and then... for me it is fulfilling because at least you have gone near to the people, you have reached them far where they are. P8\_F\_CO

We've seen lots of young students or learners. They'll come here and it would be finger count at a certain metre, then with refraction you find that they go up to 6/6, which is perfect vision. And a lot of parents come and report that there is progress at school. P4\_F\_CO

### Technological Advancements and Patient Care

Technological limitations also emerged as a significant challenge in improving eye care services. Participants acknowledged that while some hospitals have the necessary equipment, many are still operating with outdated tools. This limited access to advanced technology impacts the quality of diagnostic and therapeutic services provided, particularly for conditions that require specialized care.

Some of us are still having old equipment and we need to evolve. P1\_F\_AD

So, clinics are using very old VA Charts, very old that sometimes you would even question... P3\_F\_AD

### Challenges in Achieving Public Health Goals

Participants noted that while efforts have been made to align with public health goals like Vision 2020, challenges in resources, staffing, and infrastructure have made it difficult to meet these objectives fully. The lack of progress in disease intervention, particularly cataract surgeries, illustrates the gap between the goals set and the current state of service provision.

We are still a bit far from achieving the goals of the previous missions such as Vision 2020. P2\_F\_AD

There is a national policy, it is still a draft; and we have our own policy drafted... P3\_F\_AD

## Discussion

Achieving the best possible patient outcome requires effective resource management, prompt referral processes, and efficient service delivery, all of which support the broader objective of universal eye health coverage. In this qualitative study, we evaluated eye care services in Limpopo Province using Donabedian's Framework, centring on structure, process, and outcome themes. The findings reveal insights into resources and organizational setup, service delivery and healthcare interactions, and patient outcomes. These reflect the interconnectedness of these aspects in shaping eye care quality and access in the province.

Participants noted the presence of eye care services in many district hospitals, with each hospital having at least one optometrist. However, significant challenges associated with infrastructure, outdated equipment, and inadequate resources remain common. These findings align with previous studies highlighting a significant number of facilities lacking in essential equipment and inadequate infrastructure which further complicate access to eye care in rural settings.<sup>30–32</sup> The shortage of eye health professionals such as ophthalmic nurses and ophthalmologists significantly hampers service delivery and compromises patient outcomes. The growing complexity of eye care and increasing patient demands have made this problem worse, making a skilled workforce essential to the efficient management and treatment of eye conditions. A study by Berkowitz et al found that a lack of specialized personnel in rural areas hinders timely access to care where the workforce adequacy varies significantly, with rural areas projected to have only 29% adequacy compared to 77% in urban settings, highlighting the need for targeted recruitment strategies.<sup>33</sup> Similar studies have found that the lack of specialised eye care professionals especially in rural areas extends waiting periods for consultations and surgeries, which worsen conditions such as cataracts, as seen in this study.<sup>34,35</sup> The lack of resources, together with interruptions in spectacles provision and procuring lenses, highlights procurement inefficiencies. This supports findings from Majid et al, who identified resource scarcity and administrative barriers as a recurrent issue in South African eye care services.

Eye health disparities are worsened by limited access to specialized care and modern technology, which contrasts with the International Agency for the Prevention of Blindness' (IAPB) and WHO's global aims for Universal Health Coverage. In order to address health disparities, WHO's SPECS 2030 effort places a strong emphasis on expanding access to necessary eye care services, such as cataract surgery and refractive error correction.<sup>36</sup> This study affirms the need for a collaborative effort to address these challenges, in line with the 2030 target to increase effective cataract and refractive error coverage by 30% and 40%, respectively.

Participants reported inconsistency in cataract surgery schedules and delays in the dispensing of spectacles, illustrating a diverse representation of service delivery in Limpopo Province. Despite having outreach programs in place, especially through primary care settings and community radio stations, participants pointed out that post-COVID-19 pandemic, school outreach activities declined, which resulted in lower rates of early identification and preventative care especially among school-going children. Studies from Nepal and South Africa have shown that undiagnosed refractive errors due to a lack of school-based screenings are a leading cause of VI among children and contribute to lower academic achievements and quality of life.<sup>16,37</sup> Restoring these crucial services may need renewed collaborations across the health and education sectors, as seen by the drop in outreach in Limpopo province during COVID-19.

The referral system is critical in managing complex eye conditions, with an upward referral mechanism from clinics to tertiary hospitals. However, participants reported delays in referral processes, affecting patient outcomes. Similar findings were obtained in a study conducted in Sydney where delays in referrals led to prolonged waiting periods for patients needing specialized care, negatively affecting the patients' health outcomes.<sup>38</sup> This demonstrates the necessity of streamlining referral processes and enhancing coordination among healthcare levels to provide timely access to specialized care.

Patient satisfaction was mixed; participants noted that those who received timely care expressed positive experiences, while delays in cataract surgeries and prolonged waiting periods for spectacles negatively impacted satisfaction. This aligns with findings where higher satisfaction levels have been associated with timely interventions, including cataract

operations. For example, in a cross-sectional survey of patients receiving ophthalmic care, patients who encountered few delays reported a satisfaction rate of more than 95%.<sup>39</sup> Conversely, extended wait periods for consultations and spectacles had a detrimental effect on patient satisfaction overall, with many patients expressing frustration over delays.<sup>40</sup> Notably, improved vision following cataract surgery or refractive correction was linked to better academic outcomes, higher quality of life, better employment opportunities and economic productivity, echoing the WHO's emphasis on delivering integrated, people-centred eye care as part of UHC initiatives.<sup>41,42</sup>

The study also revealed technological limitations, with hospitals often reliant on outdated ophthalmic equipment. Access to advanced diagnostic tools, particularly for specialized care such as binocular vision or low vision remains limited, impacting patient outcomes. A study in Mozambique reported similar challenges, where outdated technology restricted optometrists from providing comprehensive care.<sup>43</sup> Furthermore, a systematic review highlights the urgent need for new, portable diagnostic tools that can be deployed in various settings, particularly in rural areas for the detection of ophthalmic conditions and refractive error.<sup>44</sup> Addressing these technological gaps is critical to achieving the WHO's recommendation for comprehensive, quality eye care services tailored to population needs.

This study's strengths lie in its comprehensive, qualitative approach, capturing perspectives from a range of eye care professionals across Limpopo Province. However, limitations include its focus on provider perspectives, which may not fully represent patient experiences. Due to the qualitative nature of the study, the results are not meant to be the perspective of all eye health professionals. It is possible that the sample did not include all the insights among eye health professionals due to the homogeneity of only female participants in the study.

Prioritizing funding to upgrade facilities and procure modern equipment will enhance diagnostic accuracy and treatment effectiveness, resulting in better patient outcomes. Addressing inefficiencies in procurement processes, such as delays in delivering spectacles and lenses, will also ensure a consistent supply of essential resources. In addition, expanding the healthcare workforce by recruiting optometrists, ophthalmologists, and ophthalmic nurses will address shortages that currently limit the quality of care. Assurance of eye health interventions within the service packages covered under pre-paid pooled financing will reduce the financial burden on the patients. In particular, following the goals of WHO and IAPB through SPECS 2030 will engender support for improving access to services for refractive error correction and cataract surgeries as a means of moving closer toward the 2030 targets related to eye health coverage. Future research could include patient satisfaction to obtain a holistic view of the quality and accessibility of eye care services.

It is also important to note that addressing the socio-economic and political issues in implementing the said recommendations is more so in Limpopo Province. Economically, recruiting an adequate number of eye care personnel and ensuring maintenance of a constant supply of relevant assistive devices, as well as including eye care in prepaid pooled financing packages will require a lot of resources. There are some political challenges whereby there is a lack of commitment from the government to make eye care a priority and to enable cooperation across various sectors to put the policies into action. International advocacy as well as support from WHO and IAPB for technical guidance and funding is essential to overcome these barriers; political in this instance means translating these advocacy activities into strong commitment and support for eye health. These efforts would ensure steady progress toward the goals stipulated in the SPECS 2030 vision and expansion of the reach of high-quality eye care provision. Research into cost-effective and sustainable eye care models tailored to underserved areas could guide policy and decision-making.

## Conclusion

In conclusion, evaluating eye care services in Limpopo using Donabedian's Framework shows some challenges in structural and process-related impacting outcomes. The study has emphasized resources, efficiency in service delivery, and timeliness of the referral system as critical factors toward optimum patient outcomes, contributing to the greater vision of universal eye health coverage. These findings show that although eye care services are available across various hospitals, limitations in infrastructure, outdated equipment, and shortages of human resources hinder the delivery of care effectively. Further limitations include procurement challenges and a lack of resources to ensure timely and consistent treatment, which ultimately impact patient satisfaction and overall outcomes. Service delivery is further affected by

delays in referral pathways, inconsistent outreach programs post-COVID, and insufficient resources for specialized care, which contribute to health disparities and unmet needs within the community.

Patient satisfaction is closely linked to the timeliness and efficiency of care, with long wait times for essential services such as cataract surgeries and spectacles adversely affecting their experiences. The technological limitations within facilities also impact the quality of diagnostic and therapeutic services, underscoring the need for modernized equipment to enhance care. The findings from this study thus draw on the interaction of resources with service delivery and patient outcomes for quality eye care, which calls for comprehensive transformation to accomplish health-related SDGs and achieve WHO and IAPB's UHC objectives.

## Acknowledgments

The authors extend their gratitude to the University of KwaZulu-Natal, the National Health Research Database (NHRD), and the Limpopo Department of Health Research Committee. We also sincerely thank the study participants for their willingness to contribute to our research.

## Disclosure

The authors report no conflicts of interest in this work.

## References

1. Amador MLR, Torres JEE. Visual disability and causes of preventable blindness. *Top Prim Care Med*. 2019;2019:81.
2. Khanna RC, Marmamula S, Rao GN. International vision care: issues and approaches. *Annu Rev Vision Sci*. 2017;3(1):53–68. doi:10.1146/annurev-vision-102016-061407
3. Rizzo J-R, Beheshti M, Hudson TE, et al. *The Global Crisis of Visual Impairment: An Emerging Global Health Priority Requiring Urgent Action*. Taylor & Francis; 2023:240–245.
4. World Health Organization [Internet]. World report on vision. 2019 [updated 2019; cited December 2, 2024]. Available from: <https://www.who.int/publications/i/item/9789241516570>. Accessed March 21, 2025.
5. Xulu-Kasaba ZN, Kalinda C. Prevalence of the burden of diseases causing visual impairment and blindness in South Africa in the period 2010–2020: a systematic scoping review and meta-analysis. *Trop Med Infect Dis*. 2022;7(2):34. doi:10.3390/tropicalmed7020034
6. Naidoo K, Kempen JH, Gichuhi S, et al. Prevalence and causes of vision loss in sub-saharan Africa in 2015: magnitude, temporal trends and projections. *Br J Ophthalmol*. 2020;104(12):1658–1668. doi:10.1136/bjophthalmol-2019-315217
7. Dougnon A, Guirou N, Bakayoko S, et al. Situation analysis of uncorrected refractive errors in Sub-saharan Francophone African Countries. 2021.
8. Lawan A. Optimizing outcome of cataract surgery in resource scarce sub-saharan Africa. In: Artashes Z, editor. *Difficulties in Cataract Surgery*. Rijeka: IntechOpen; 2018:Ch.6.
9. Lecuona K, Cook C. South Africa's cataract surgery rates: why are we not meeting our targets? *SAMJ*. 2011;101(8):510–512.
10. Mahomed S, Nadasan T, Mahomed OH. Cost of cataract surgery at a provincial hospital in South Africa. *Afr Vision Eye Health*. 2024;83(1):901. doi:10.4102/aveh.v83i1.901
11. Kiva Z, Wolvaardt J. Assessing awareness and treatment knowledge of preventable blindness in rural and urban South African communities. *SAMJ*. 2024;114(6B):50–56.
12. Khoza LB, Nunu WN, Tshivhase SE, et al. Survey on prevalence of cataract in selected communities in Limpopo province of South Africa. *Sci Afr*. 2020;8:e00352. doi:10.1016/j.sciaf.2020.e00352
13. World Health Organization. Political declaration of the high-level meeting on universal health coverage: universal health coverage: moving together to build a healthier world. 2019.
14. World Health Organization. Global eye care targets endorsed by member states at the 74th world health assembly. 2021. Available from: <https://www.who.int/news/item/27-05-2021-global-eye-care>. Accessed March 21, 2025.
15. Basu D. National strategic plan for the prevention and control of non-communicable diseases in South Africa. *South Afr J Public Health*. 2022;5:67.
16. Magakwe TS, Hansraj R, Xulu-Kasaba ZN. The impact of uncorrected refractive error and visual impairment on the quality of life amongst school-going children in sekukhune district (Limpopo), South Africa. *Afr Vision Eye Health*. 2022;81(1):7.
17. Eksteen S, Eikelboom RH, Kuper H, Launer S, Swanepoel DW. Prevalence and characteristics of hearing and vision loss in preschool children from low income South African communities: results of a screening program of 10,390 children. *BMC Pediatric*. 2022;22(1):22. doi:10.1186/s12887-021-03095-z
18. Majid H. Monitoring and evaluation of eye health service delivery: a public-private case study in the umgungundlovu district, kwazulu-natal. University of KwaZulu-Natal, Durban; 2023.
19. Tshabalala K, Rispel LC. Piercing the veil on the functioning and effectiveness of district health system governance structures: perspectives from a South African province. *Health Res Policy Syst*. 2023;21(1):89. doi:10.1186/s12961-023-01044-z
20. Malakoane B, Chikobvu P, Heunis C, Kigozi G, Kruger W. Health managers and community representatives' views of a system-wide intervention to strengthen public healthcare in the free state, South Africa. *Afr Health Sci*. 2023;23(1):747–764. doi:10.4314/ahs.v23i1.79
21. Donabedian A. Evaluating the quality of medical care. *Milbank Q*. 2005;83(4):691. doi:10.1111/j.1468-0009.2005.00397.x
22. Botma Y, Labuschagne M. Application of the donabedian quality assurance approach in developing an educational programme. *Innovations Educ Teach Int*. 2019;56(3):363–372. doi:10.1080/14703297.2017.1378587

23. Binder C, Torres RE, Elwell D. Use of the donabedian model as a framework for covid-19 response at a hospital in suburban Westchester County, New York: a facility-level case report. *J Emerg Nurs*. 2021;47(2):239–255. doi:10.1016/j.jen.2020.10.008
24. Statistics South Africa. General household survey 2014. Statistics South Africa; 2017.
25. Polit DF, Beck CT. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. Lippincott Williams & Wilkins; 2008.
26. World Medical Association. World medical association declaration of Helsinki. Ethical principles for medical research involving human subjects. *Bull World Health Organ*. 2001;79(4):373.
27. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008;62(1):107–115. doi:10.1111/j.1365-2648.2007.04569.x
28. Guba EG, Lincoln YS. *Fourth Generation Evaluation*. Sage; 1989.
29. Lincoln YS, Guba EG. *Naturalistic Inquiry*. Beverly Hills, Calif.: Sage Publications; 1985.
30. Maake ME, Moodley VR. An evaluation of the public sector optometric service provided within the health districts in kwazulu-natal, South Africa. *Afr Vision Eye Health*. 2018;77(1):1–9.
31. Gilbert CE, Babu RG, Gudlavalleti ASV, et al. Eye care infrastructure and human resources for managing diabetic retinopathy in India: the India 11-city 9-state study. *Indian J Endocrinol Metab*. 2016;20(Suppl 1):S3–S10. doi:10.4103/2230-8210.179768
32. Kumari R, Singh KP, Dubey G, et al. Chronic impediment in utilization of eye-care services. *J Ophthalmol Res*. 2020;3(3):45–56. doi:10.26502/fjor.2644-00240020
33. Berkowitz ST, Finn AP, Parikh R, Kuriyan AE, Patel S. Ophthalmology workforce projections in the United States, 2020 to 2035. *Ophthalmology*. 2024;131(2):133–139. doi:10.1016/j.ophtha.2023.09.018
34. Owusu-Afriyie B, Peter N, Ivihi F, Kopil I, Gende T. Barriers to the uptake of eye care services: a cross-sectional survey from rural and urban communities. *PLoS One*. 2024;19(8):e0308294. doi:10.1371/journal.pone.0308294
35. Jain BK, Jain E. Rural development through eye care: a new dimension of possibilities. *Indian J Ophthalmol*. 2023;71(2):330–334. doi:10.4103/ijo.Ijo\_105\_23
36. World Health Organization. Report of the 2030 targets on effective coverage of eye care. World Health Organization; 2022.
37. Thorud H-MS, Mudvari PR, Falkenberg HK. Academic performance and musculoskeletal pain in adolescents with uncorrected vision problems. *BMC Pediatr*. 2024;24(1):202. doi:10.1186/s12887-024-04681-7
38. Khou V, Ly A, Moore L, et al. Review of referrals reveal the impact of referral content on the triage and management of ophthalmology wait lists. *BMJ open*. 2021;11(9):e047246. doi:10.1136/bmjopen-2020-047246
39. Shah R, Mishra SK, Sharma P. Patient satisfaction towards eye care services at tertiary eye hospitals in madhesh province, Nepal: patient satisfaction of eye care services. *J Chitwan Med Coll*. 2024;14(3):23–31.
40. Asodariya R, Bhatnagar KR, Tandon M, et al. A compressive assessment of patient satisfaction with ophthalmology with ophthalmology clinic services: a study at a tertiary care academic institution amidst and after the covid-19 pandemic. *Indian J Ophthalmol*. 2024;72:1798–1804.
41. Lee L, Moo E, Angelopoulos T, Yashadhana A. Integrated people-centered eye care: a scoping review on engaging communities in eye care in low-and middle-income settings. *PLoS One*. 2023;18(1):e0278969. doi:10.1371/journal.pone.0278969
42. Thulasiraj R. Primary eye care – key to universal eye health. *Indian J Ophthalmol*. 2022;70(5):1448–1449. doi:10.4103/ijo.IJO\_740\_22
43. Manuel RA, Latorre Arteaga S, Dos Santos II, et al. Integration of optometry at the national health system: the case of the first optometrists in Mozambique. 2022.
44. Labkovich M, Paul M, Kim E, et al. Portable hardware & software technologies for addressing ophthalmic health disparities: a systematic review. *Digital Health*. 2022;8:20552076221090042. doi:10.1177/20552076221090042

## Clinical Optometry

### Publish your work in this journal

Clinical Optometry is an international, peer-reviewed, open access journal publishing original research, basic science, clinical and epidemiological studies, reviews and evaluations on clinical optometry. All aspects of patient care are addressed within the journal as well as the practice of optometry including economic and business analyses. Basic and clinical research papers are published that cover all aspects of optics, refraction and its application to the theory and practice of optometry. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/clinical-optometry-journal>

**Dovepress**  
Taylor & Francis Group