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ORIGINAL RESEARCH

Low-Vision Rehabilitation Services in Saudi Arabia: A Nationwide Survey of Optometrists on Current Status and Future Directions

Abdulaziz Alshehri[1], Abdulmajeed Al Khathami[2], Amani Al Ghramah[3], Majed AlQurashi[4], Saud AlJohani[5]

[1]Unit of Ophthalmology, Department of Surgery, Taif University, Taif, Saudi Arabia; [2]Department of Ophthalmology, King Fahad Hospital, Al Baha Health Cluster, Al Baha, Saudi Arabia; [3]Department of Optometry, Prince Mishari Bin Saud Hospital, Al Baha Health Cluster, Al Baha, Saudi Arabia; [4]Department of Ophthalmology, AlHada Armed Forces Hospital, Taif, Saudi Arabia; [5]Department of Ophthalmology, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

Correspondence: Abdulmajeed Al Khathami, Email Abdulmajeed.khathami@gmail.com

Background: Low vision (LV) is a significant public health challenge with profound effects on patients and their families. In Saudi Arabia, studies indicate a high prevalence of LV, yet low vision services (LVS) remain limited, with gaps in optometrist knowledge, training, and service accessibility. This study evaluates the current state of LV services, documents optometrist involvement, and identifies barriers to delivering LVS.

Methods: A nationwide, cross-sectional study surveyed 275 optometrists using a validated, self-administered electronic questionnaire. Awareness, clinical practices, referral patterns, and perceived barriers were assessed. Multivariate logistic regression analyzed awareness levels and barriers, with statistical significance set at $p<0.05$.

Results: Moderate awareness of the WHO definition of LV was observed (70.1%), significantly higher among those with formal training (90.1%, $p<0.001$). Only 36.4% provided LV services, primarily in the central region. Low vision cases constituted 1% of patient loads for most participants (44.4%). Key barriers included device unavailability (68.4%), insufficient training (65.8%), and high costs (50.9%). Diabetic retinopathy (70.9%), glaucoma (63.3%), and hereditary conditions (46.5%) were leading causes of LV.

Conclusion: Critical gaps in LV care include insufficient awareness, uneven service distribution, and financial/training-related barriers. Enhancing education, improving affordability, and fostering multidisciplinary care are essential. Region-specific interventions are urgently needed to ensure equitable access to LVS across Saudi Arabia.

Keywords: low vision, optometrist training, vision Rehabilitation, visual impairment

Background

Visual impairment is a pressing global health issue, profoundly affecting individuals and society.[1] The World Health Organization (WHO) categorizes visual impairment into low vision and blindness, defined by specific thresholds of visual acuity and field of vision.[2] Low vision, characterized by visual acuity worse than 6/18 but better than 3/60 or a visual field narrower than 20 degrees, significantly impacts daily life, limiting economic opportunities, social interactions, and psychological well-being.[3] However, access to specialized LVS can help mitigate these challenges, improving functional abilities and overall quality of life.[3]

In Saudi Arabia, low vision is a major public health concern. National estimates indicate a prevalence of 7.8% for low vision and 1.5% for blindness—rates far higher than those in countries like the United States.[4,5] These disparities are further exacerbated by regional variations, with prevalence rates ranging from 0.7% in Bisha to 6.4% in Asha, highlighting inequities in access to care.[6–8] Despite the growing burden of visual impairment, access to comprehensive low vision rehabilitation services (LVRS) remains alarmingly limited. Recent evidence indicates that only 4% of healthcare facilities in Saudi Arabia provide LVRS, predominantly concentrated in urbanized central regions, leaving

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rural and underserved areas critically underserved.[9] Current services primarily focus on basic optometric care, such as prescribing optical aids, while critical components like mobility training and multidisciplinary support are often lacking.[10] The leading causes of low vision in Saudi Arabia include diabetic retinopathy, glaucoma, and hereditary conditions, with consanguineous marriages contributing to the high prevalence of genetic disorders such as retinitis pigmentosa and optic atrophy. However, the provision of low vision care faces significant barriers, including insufficient practitioner training, limited availability of low vision devices, and financial constraints.[11]

Globally, similar challenges in low vision care persist. In India, for example, barriers such as insufficient practitioner training, limited access to devices, and financial constraints have hindered service delivery.[12] Similarly, in Canada, only 35% of optometrists provide low vision services, citing lack of training and resources as major obstacles.[13] These global trends underscore the universal need for improved education, better access to low vision aids, and collaborative efforts to address the growing demand for care.

Given these challenges, this study aims to evaluate the current state of LVS in Saudi Arabia, identify barriers faced by practitioners and patients, and propose actionable strategies to improve service delivery. By examining the knowledge, practices, and referral patterns of eye care professionals, as well as the availability and accessibility of LVS, this study seeks to provide evidence-based recommendations to bridge the gap between the rising demand for care and its provision.

Methods

Study Design and Study Period

This was a cross-sectional, nationwide study conducted between July and December 2024. The study targeted all hospitals in Saudi Arabia that house ophthalmology departments to ensure a comprehensive representation of healthcare facilities providing LVS. Ethical clearance for the research was granted by the Institutional Review Board (IRB) of Taif University No. (HAPO-02-T-105) ensuring compliance with ethical standards for research involving human participants.

Sample Size

The sample size calculation was based on data from a previous study conducted in Saudi Arabia, which found that 26.5% of respondents correctly identified the definition of low vision in terms of visual acuity. The OpenEpi online calculator was used to determine the required sample size with a confidence level of 97% and a margin of error of 5% (alpha = 0.05). Based on these parameters, the minimum required sample size was calculated to be 270 participants. A total of 275 participants completed the survey.

Sampling and Data Collection Approach

A purposive sampling method was employed to ensure the recruitment of optometrists with relevant expertise in LV care. The survey was distributed electronically through professional networks, which included membership-based groups of optometrists and ophthalmologists, as well as formal associations such as the Saudi Society of Optometry and regional healthcare institutions. This approach ensured a diverse representation of practitioners actively engaged in low vision care. Efforts were made to minimize selection bias by reaching out to a diverse range of practitioners across different regions and healthcare settings, ensuring a representative sample of the population under study. This method was chosen to provide a scientifically sound basis for exploring the challenges and practices in low vision care.

Study Tool

The survey instrument consisted of 27 items designed to comprehensively assess key aspects of low vision care and was divided into four main sections. Section A focused on the personal profile of participants, gathering demographic information such as age, gender, professional role, and years of experience to contextualize responses. Section B explored the primary practice profile, including the type of practice, patient volume, and the prevalence of LV patients in their clinical setting. Section C evaluated the level of low vision services (LVS) offered by optometrists and the barriers to providing such services. This section included questions about resource availability, training gaps, and

financial constraints, as well as three hypothetical clinical cases designed to assess participants' decision-making and practical approaches to managing LV patients. Section D examined referral patterns, including the extent of collaboration with specialized LV centers or NGOs, and participants' awareness of national or regional organizations involved in LV care.

Tool Development and Validation

The survey instrument was developed based on an extensive review of existing literature, drawing on validated frameworks and findings from studies conducted in India and Canada on low vision care provision.[12,13] To ensure its relevance and robustness, a two-phase validation process was implemented. In the first phase, content validity was established through consultations with a panel of four experts in LV care and ophthalmology. The experts evaluated the survey for clarity, alignment with the study objectives, and comprehensiveness. In the second phase, a pilot test was conducted with a subset of optometrists to assess the reliability and practical applicability of the questions. Feedback from both phases was incorporated to refine and optimize the instrument, ensuring its relevance and suitability for the Saudi Arabian context.

Statistical Analysis

The data collected through the survey were analyzed using the Statistical Package for the Social Sciences (SPSS, version 26) and R software for data visualization and additional statistical computations. Descriptive statistics, including means, frequencies, and percentages, were employed to summarize demographic variables and categorical responses. Inferential statistical methods, such as chi-square tests and logistic regression, were applied to identify significant associations and predictors related to barriers and facilitators of low vision care. A p-value of less than 0.05 was considered statistically significant. Figures, including bar charts, pie charts, and radar plots, were generated using R to provide clear and detailed visualizations of the results, ensuring robust representation of the study findings.

Results

Demographic and Practice Characteristics

A total of 275 eye care practitioners participated in the study (Table 1). The majority were male (55.6%) and practiced predominantly in the central region of Saudi Arabia (54.5%). Over half of the respondents (54.2%) had 0–5 years of professional experience, while only 1.8% reported over 26 years of practice. Educational attainment varied, with most

Table 1 Demographic Characteristics and Awareness of the WHO Definition of Low Vision Across Demographic and Professional Variables

Variables		Total n (%)	Positive Awareness n (%)	Negative Awareness n (%)	P-value
Geographic region	Central region	150 (54.5%)	119 (79.3%)	31 (20.7%)	0.09
	East Region	20 (7.3%)	18 (90%)	2 (10%)	
	North Region	20 (7.3%)	18 (90%)	2 (10%)	
	Province (any other)	7 (2.5%)	7 (100%)	0 (0%)	
	South Region	33 (12.0%)	24 (72.7%)	9 (27.3%)	
	West Region	45 (16.4%)	30 (66.7%)	15 (33.3%)	
Gender	Female	122 (44.4%)	101 (82.8%)	21 (17.2%)	0.41
	Male	153 (55.6%)	115 (75.2%)	38 (24.8%)	

(*Continued*)

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Table 1 (Continued).

Variables		Total n (%)	Positive Awareness n (%)	Negative Awareness n (%)	P-value
Years of practice	0–5 year	149 (54.2%)	130 (87.2%)	19 (12.8%)	**<0.001***
	6–15 years	91 (33.1%)	69 (75.8%)	22 (24.2%)	
	16 −25 years	30 (10.9%)	14 (46.7%)	16 (53.3%)	
	> 26 years	5 (1.8%)	3 (60%)	2 (40%)	
Your level of education	Bachelor's Degree	161 (58.5%)	134 (83.2%)	27 (16.8%)	**0.001***
	Diploma	40 (14.5%)	23 (57.5%)	17 (42.5%)	
	Master's Degree	67 (24.4%)	52 (77.6%)	15 (22.4%)	
	PhD	7 (2.5%)	7 (100%)	0 (0%)	
Low Vision Training	No	111 (40.4%)	115 (70.1%)	49 (29.9%)	**<0.001***
	Yes	164 (59.6%)	101 (90.1%)	10 (9.0%)	
Primary practice	Governmental	150 (54.5%)	114 (76%)	36 (24%)	0.1
	Others	119 (43.3%)	6 (100%)	0 (0%)	
	Private Practice	6 (2.2%)	96 (80.7%)	23 (19.3%)	
Estimated average of patient you see and refract weekly	125 patients or more.	132 (48.0%)	0	5 (100%)	**<0.001***
	20–50 patients	84 (30.5%)	104 (78.8%)	28 (21.2%)	
	50–75 patients	45 (16.4%)	70 (83.3%)	14 (16.7%)	
	75–125 patients	5 (1.8%)	35 (77.8%)	10 (22.2%)	
	None	9 (3.3%)	7 (77.8%)	2 (22.2%)	
The percentage of Low Vision patients seen in your primary practice	1%	122 (44.4%)	97 (79.5%)	25 (20.5%)	0.4
	3%	66 (24.0%)	47 (71.2%)	19 (28.8%)	
	5%	43 (15.6%)	37 (86%)	6 (14.0%)	
	10%	30 (10.9%)	25 (83.3%)	5 (16.7%)	
	20%	14 (5.1%)	10 (71.4%)	4 (28.6%)	

Note: *Significant at $p < 0.05$.

participants holding a bachelor's degree (58.5%), followed by master's degree holders (24.4%), and a small percentage with a PhD (2.5%). Notably, 59.6% of optometrists had not received formal low-vision training post-graduation. Most practitioners worked in government institutions (54.5%) and managed an average of 20–50 patients weekly (48%). The majority of participants (44.4%) reported that LV cases constitute 1% of their patient load in primary practice.

Awareness of the WHO Definition of Low Vision

The findings in Table 1 reveal disparities in awareness of the WHO definition of LV among optometrists. Practitioners in the north and east regions demonstrated the highest levels of awareness (90%), while those in the west reported the lowest (66.7%, p=0.09). Years of professional experience significantly influenced awareness, with 0–5 years of practice

showing the highest awareness (87.2%) and over 26 years demonstrating the lowest (60%, p<0.001). Educational background was also a factor, as bachelor's degree holders exhibited higher awareness (83.2%) compared to diploma holders (57.5%, p=0.001). Optometrists who had received LV training were significantly more aware (90.1%) compared to those without training (70.1%, p<0.001).

Recognition and Assessment of Low Vision Cases

Table 2 highlights the clinical practices used by optometrists for recognizing and assessing LV cases. While 78.9% correctly identified the criteria for LV as being based on both visual acuity and visual field, 5.1% were unsure. Regarding the definition of low vision based on visual acuity, 40.4% of respondents cited the 6/18 threshold, while only 30.9% correctly identified the visual field criterion of 20 degrees. Interestingly, 51.6% categorized LV patients based on functional needs, in contrast to the 41.5% who followed the WHO definition. A minority (36.4%) offered LV care in their primary practice, with logMAR or ETDRS charts for visual acuity (54.6%) and Amsler grid or automated perimetry for visual field testing (44%) being the most commonly available tools.

Table 2 Recognition Criteria and Assessment Approaches in Low Vision Services

Items		Frequency (n)	Percentage (%)
Recognition of LV case			
The criteria for low vision are based on	Contrast acuity	4	1.5%
	Not sure	14	5.1%
	Visual acuity	35	12.7%
	Visual acuity and visual field	217	78.9%
	Visual field	5	1.8%
You consider a person is having low vision when the best corrected visual acuity in the better eye is worse than	6/12 (20/40)	10	3.6%
	6/18 (20/60)	107	38.9%
	6/36 (20/120)	47	17.1%
	6/60 (20/200)	111	40.4%
Based on the visual field from the point of fixation, low vision is defined as	10 Degrees	74	26.9%
	20 Degrees	85	30.9%
	30 Degrees	14	5.1%
	Not sure	102	37.1%
In your practice, which criteria do you follow for categorizing a patient with low vision?	Not sure	14	5.1%
	Patient needs (eg, unable to perform daily activities/ hobbies)	142	51.6%
	Poor vision in one eye only	5	1.8%
	WHO (World Health Organization) criteria	114	41.5%
Assessment of visual impairment			
Do you offer low vision care in your primary practice?	No	175	63.6%
	Yes	100	36.4%

(*Continued*)

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Table 2 (Continued).

Items		Frequency (n)	Percentage (%)
LV assessment tools in your clinic*	logMAR (logarithm of the minimum angle of resolution) chart or EDTRS chart for distance visual acuity.	150	54.6%
	Lighthouse continuous text card or equivalent for near visual acuity.	75	27.3%
	Pelli-Robson Chart or equivalent for Contrast sensitivity.	40	14.5%
	Amsler grid or automated perimetry for visual field testing.	121	44%

Note: *Participants could choose more than one option.

Provision and Referral of Low Vision Services

The provision of LVS was limited among optometrists (Table 3). Only 19.6% provided LV devices, while 37.8% referred patients to specialized centers. Basic magnifiers were the most widely available device (42.9%), followed by telescopes (21.5%) and electronic devices (24.7%). Rehabilitation services were rare (4.7%). Although 52.7% of practitioners adhered to referral guidelines, only 20.7% had partnerships with LV centers or NGOs. Awareness of organizations like the National Association of the Blind (Kafeef) was evenly split (49.8%). The results demonstrated a significant

Table 3 Referral Patterns, Rehabilitation Approaches, and Device Availability in Low Vision Services

Items		Frequency (n)	Percentage (%)
Assessment of Disability			
What do you do when you get a patient with low vision or visual needs	Not sure	10	3.6%
	Provide best possible spectacle correction	94	34.2%
	Provide low vision devices	54	19.6%
	Provide rehabilitation	13	4.7%
	Refer to other hospitals/ specialized centers	104	37.8%
Case Scenario 1: Patient with early ARMD, with a BCVA of 6/12 and a main goal of reading (not happy with his reading glasses).	Asses for basic magnification and lighting requirement	49	17.8%
	Give maximum reading spectacle power	115	41.8%
	Others	17	6.2%
	Refer to KKESH	10	3.6%
	Refer to LV optometrist ***(Correct Answer)***	73	26.5%
	Refer to Multidisciplinary LV Clinic	11	4.0%

(*Continued*)

Table 3 (Continued).

Items		Frequency (n)	Percentage (%)
Case Scenario 2: Patient with advanced ARMD, with a BCVA of 6/60 and goals of reading (not happy with his reading glasses)	Asses for basic magnification and lighting requirement	44	16.0%
	Give maximum reading spectacle power	13	4.7%
	Others	18	6.5%
	Refer to KKESH	29	10.5%
	Refer to LV optometrist	134	48.7%
	Refer to Multidisciplinary LV Clinic ***(Correct Answer)***	37	13.5%
Type of LV devices available and you can provide in your practices*	Magnifiers	118	42.9%
	Telescopes	59	21.5%
	Electronic and TV devices	68	24.7%
	Other assistive devices	51	18.5%
	None	139	50.5%
Referral Patterns			
Do you follow referral guidelines for low vision?	No	130	47.3%
	Yes	145	52.7%
Do you have any tie-ups with low vision centers/NGOs (non-governmental organizations)/blind schools?	No	218	79.3%
	Yes	57	20.7%
Are you aware of the National Association of the Blind (Kafeef)?	No	138	50.2%
	Yes	137	49.8%
Do you know any organizations which provide low vision rehabilitation?	No	155	56.4%
	Yes	120	43.6%

Note: *Participants could choose more than one option.

association between optometrist characteristics, including gender, low vision (LV) training, primary practice setting, the estimated average number of patients seen and refracted weekly, and their referral patterns to King Khaled Eye Specialist Hospital (KKESH). These findings underscore the influence of individual and practice-related factors on the likelihood of referring patients to specialized tertiary care centers such as KKESH (Data not shown in the tables).

Common Causes of Low Vision and Barriers to Care

Practitioners identified diabetic retinopathy (70.9%) and glaucoma (63.3%) as the most frequent causes of low vision (Figure 1).

Barriers to providing LV care were predominantly the unavailability of devices (68.4%) and insufficient training (65.8%) (Figure 2), alongside high costs of devices (50.9%), lack of practitioner awareness (45.5%), difficulties in meeting patient needs (43.3%), and time constraints (29.5%). Additionally, optometrists-reported barriers to patient

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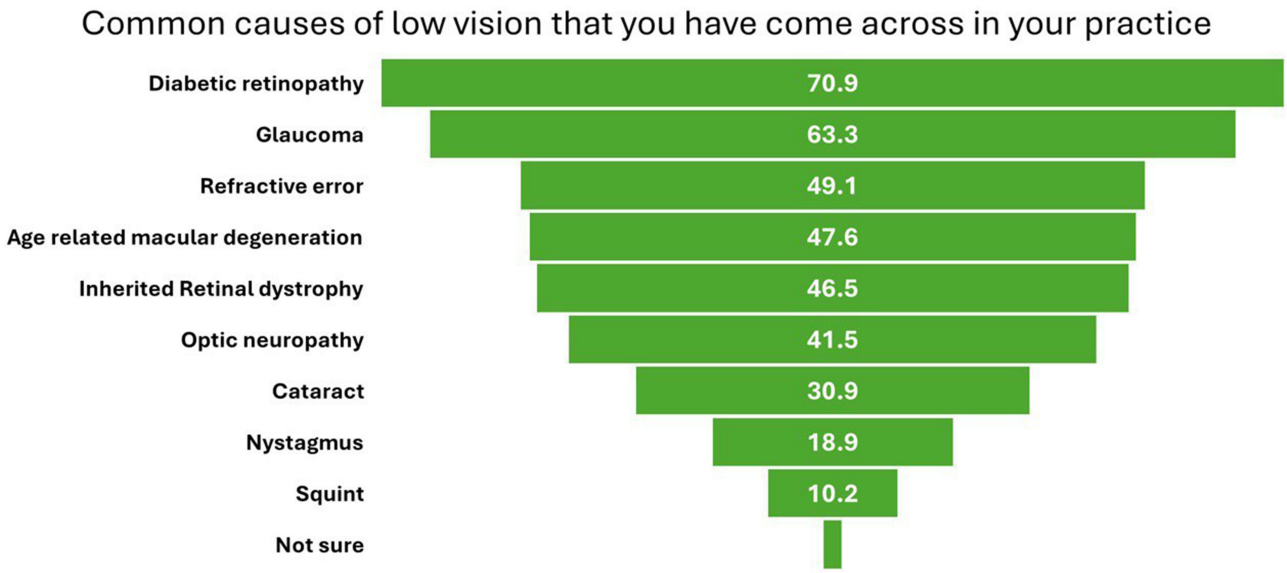

Figure 1 Practitioner-reported common causes of Low Vision in clinical practice.

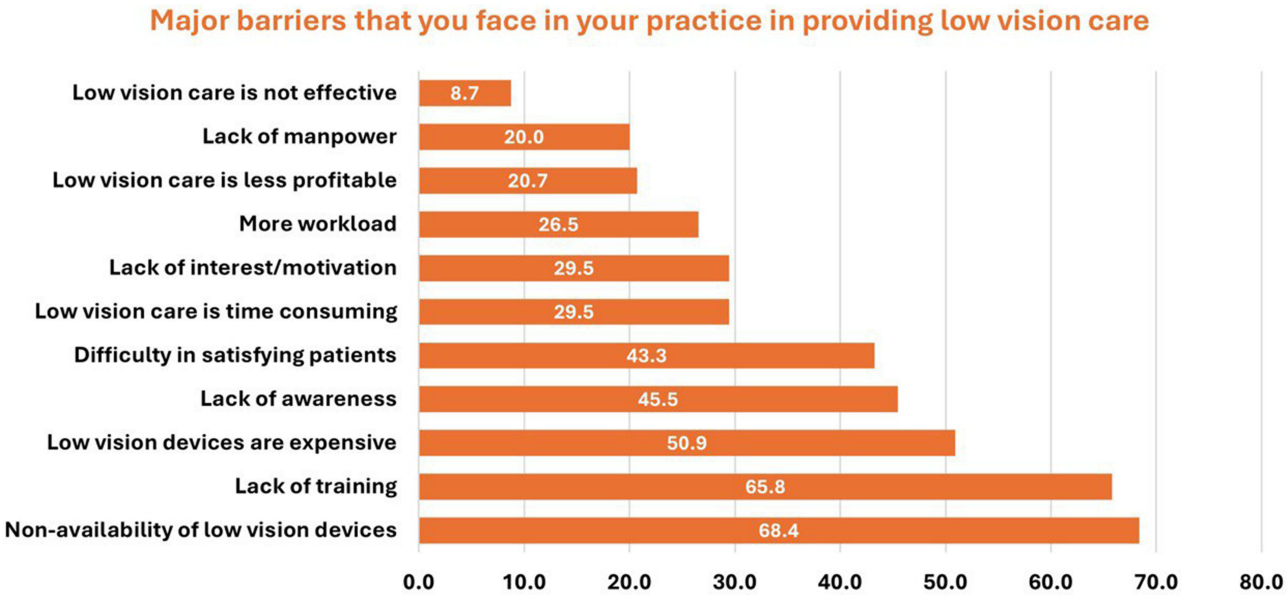

Figure 2 Key barriers identified by practitioners in providing Low Vision care services.

access included lack of awareness among patients (35%) and the unavailability of low vision care centers (35%) (Figure 3), as well as high costs of services (19%) and low patient motivation (11%).

Recommendations for Improving Low-Vision Care

Optometrists emphasized the need for increased training programs (86.2%) and affordable LV devices (82.9%) (Figure 4). Additional recommendations included improving device availability (71.3%), raising awareness among practitioners (70.2%), and conducting public education campaigns (68%). Integrating low-vision care into medical curricula was suggested by 45.1% of respondents.

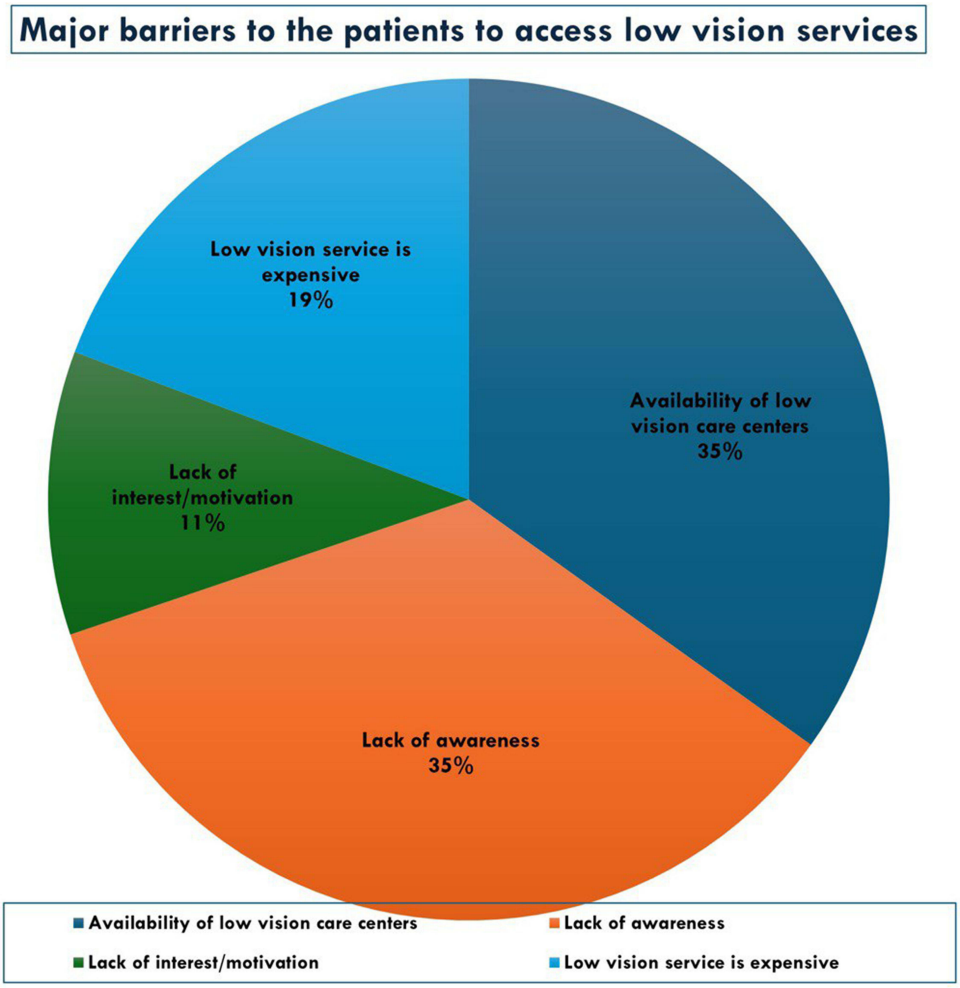

Figure 3 Major practitioner-reported barriers affecting patient access to Low Vision services.

Multivariate Analysis of Factors Influencing Awareness

The multivariate logistic regression analysis (Table 4) identified significant predictors of awareness regarding the WHO definition of low vision. Practitioners with 0–5 years of experience were more likely to have higher awareness, serving as the reference category. Increasing years of practice were associated with a decline in awareness, with an adjusted odds ratio (AOR) of 0.02 (95% CI: 0.01–0.38, p=0.01) for those with over 26 years of experience. Low vision training emerged as a strong positive predictor, with an AOR of 6.1 (95% CI: 2.3–16.6, p<0.001). Multivariate analysis revealed that practitioners seeing more than 125 patients per week were significantly less likely to demonstrate awareness (AOR=0.08, 95% CI: 0.01–0.66, p=0.01). Additionally, practitioners seeing 20–50 patients per week also exhibited relatively low awareness levels, highlighting the need for targeted educational interventions across all practice volumes.

Discussion

This study provides a comprehensive analysis of the current state of LVS in Saudi Arabia, highlighting significant gaps in care, particularly in service availability, training, and accessibility. While awareness of the WHO definition of low vision was moderate (70.1%), only 41.5% of optometrists adhered to standard assessment criteria, and just 36.4% offered low vision services in primary practice. Barriers such as the unavailability of devices (68.4%), lack of training (65.8%), and high costs (50.9%) were major challenges. Furthermore, diabetic retinopathy (70.9%) and hereditary conditions (45.5%)

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Figure 4 Radar Chart of key recommendations to enhance Low Vision care services.

were identified as the leading causes of low vision, with significant geographic disparities in service availability, predominantly concentrated in the central region.

Awareness of the WHO definition of low vision among practitioners in Saudi Arabia was moderate (70.1% among untrained practitioners) but significantly higher (90.1%) among those with training, highlighting the critical need for specialized education. This aligns with global trends, where insufficient training is a major barrier, as seen in Canada and

Table 4 Factors Influencing Awareness of WHO Definition of Low Vision: Multivariate Analysis Results

Variables		AOR	Lower (CI 95%)	Upper (CI 95%)	P-value
Years of practice	> 26 years	0.02	0.01	0.38	**0.01***
	16 −25 years	0.09	0.03	0.29	**<0.001***
	6–15 years	0.21	0.08	0.53	**<0.001***
	0–5 year	**r (1)**			

(*Continued*)

Table 4 (Continued).

Variables		AOR	Lower (CI 95%)	Upper (CI 95%)	P-value
Your level of education	Bachelor's Degree	r (1)			
	Diploma	0.06	0.01	0.32	**<0.001***
	Master's Degree	1.72	0.70	4.23	0.23
	PhD	-	-	-	-
Low Vision Training	No	r (1)			
	Yes	6.1	2.3	16.6	**<0.001***
Estimated average of patient you see and refract weekly	125 patients or more.	0.08	0.01	0.66	**0.01***
	20–50 patients	0.08	0.01	0.68	**0.02***
	50–75 patients	1.85	0.24	14.35	0.55
	75–125 patients	0.70	0.07	7.16	0.76
	None	r (1)			

Note: *Significant at $p < 0.05$.

India.[12,13] The inverse relationship between years of experience and awareness, with those over 26 years showing the lowest awareness (60%, $p<0.001$), underscores the need for continuous professional education.[14] In contrast, newer graduates (0–5 years) demonstrated higher awareness (87.2%), reflecting the impact of updated curricula in optometry and ophthalmology training.

While the majority of practitioners (78.9%) correctly recognized both visual acuity and visual field as criteria for low vision, significant gaps in understanding persist. For example, only 30.9% correctly identified the WHO-defined visual field threshold of 20 degrees, and 37.1% were unsure. These gaps mirror findings from India, where many optometrists reported uncertainty about defining low vision beyond basic acuity thresholds.[12] The reliance on functional needs rather than standardized criteria for categorizing low vision (51.6%) reflects a lack of adherence to global guidelines. This approach, while patient-centered, risks inconsistencies in care delivery and may contribute to underdiagnosis.[15] The limited use of advanced assessment tools, such as Pelli-Robson charts for contrast sensitivity (14.5%) and automated perimetry for visual fields (44%), further highlights the need for improved clinical infrastructure and training.[16] Given that the majority of participants reported seeing only 1% of low-vision patients in their primary practice, it is reasonable to infer that the low frequency of such cases may contribute to the limited availability of low-vision aids and services in their clinical settings. This highlights the need for centralized referral systems and specialized low-vision centers to manage these cases effectively.

The association between optometrist characteristics and referral patterns to King Khaled Eye Specialist Hospital (KKESH) underscores the influence of individual training and practice-related factors in low vision care.[17] Practitioners with low vision training were more likely to refer patients appropriately, highlighting the need for targeted education. High patient volumes in certain settings may hinder detailed assessments, leading to varying referral practices. The limited partnerships with low vision centers (20.7%) and NGOs further centralize care, overburdening tertiary facilities like KKESH. Strengthening regional collaborations, standardizing referral pathways, and expanding practitioner training are crucial for decentralizing services and improving equitable access to LV care.[17]

This study found that only 36.4% of participants offered LVS in their primary practice, and device availability was limited. Magnifiers (42.9%) and telescopes (21.5%) were the most commonly available devices, while advanced options, such as electronic aids, were provided by only 24.7% of respondents. These findings are consistent with a 2023 national study in Saudi Arabia, which revealed that only 4% of healthcare facilities offered LV rehabilitation services, predominantly in the central region.[9] Internationally, similar challenges have been reported. In Canada, only 35% of optometrists

provided LVS, focusing primarily on basic interventions.[13] This highlights a universal trend: low vision care is often deprioritized due to resource constraints, lack of training, and financial limitations.

The most frequently reported barriers in Saudi Arabia were the unavailability of devices (68.4%) and insufficient training (65.8%), followed by high costs (50.9%). These barriers are not unique to Saudi Arabia. In Canada, 75% of optometrists identified the high cost of LV devices as a key challenge, while in India, accessibility and financial constraints were cited as major obstacles.[12,13] These findings underscore the global need for affordable solutions, such as subsidized devices and funding programs. Patient-related barriers were also prominent, with lack of awareness (35%) and unavailability of LV care centers (35%) being the most common. These findings are consistent with the Indian study, which emphasized the need for public education campaigns to bridge the gap between patient needs and service availability.[12]

The most common causes of LV in Saudi Arabia, as reported by optometrists, were diabetic retinopathy (70.9%) and glaucoma (63.3%). These findings align with global trends, where these conditions are leading contributors to visual impairment.[12] However, hereditary and congenital conditions accounted for a disproportionately high percentage of cases (46.5%) in Saudi Arabia, reflecting the impact of consanguineous marriages.[18] This unique demographic factor emphasizes the need for targeted public health interventions, such as genetic counseling and awareness campaigns to mitigate the risk of hereditary conditions.

The geographic disparities in service availability, with most services concentrated in the central region, reflect broader global trends where urban areas are better served than peripheral regions.[19,20] Expanding services to underserved areas is crucial to ensuring equitable access. Notably, hereditary and congenital conditions accounted for 46.5% of low vision cases in Saudi Arabia, a disproportionately high percentage compared to global trends. This is likely due to the prevalence of consanguineous marriages, highlighting the need for region-specific interventions, such as genetic counseling and public education campaigns to mitigate these risks.[21]

To improve LVS in Saudi Arabia, a multifaceted approach is essential. Enhancing practitioner training through specialized programs and integrating LV care into optometry and ophthalmology curricula is crucial to bridging knowledge gaps. Expanding the availability and affordability of LV devices, potentially through government subsidies or partnerships with non-governmental organizations, would address financial barriers and improve access. Public awareness campaigns are necessary to educate communities about low vision, its management, and available resources, fostering earlier diagnosis and treatment. Establishing multidisciplinary care models, involving occupational therapists, psychologists, and LV specialists, would ensure comprehensive rehabilitation, addressing both functional and psychological needs. Additionally, expanding services to underserved regions through strategic resource allocation and policy-driven initiatives would promote equity in access. These combined efforts are critical to bridging the gap between growing demand and limited-service provision, ultimately enhancing the quality of life for individuals with low vision in Saudi Arabia.

Limitations

This study has several limitations. The use of convenience sampling may have introduced selection bias, limiting the generalizability of findings to all practitioners in Saudi Arabia. Additionally, the self-reported nature of the survey may have resulted in response bias, particularly in assessing knowledge and practices. The lack of direct observation or verification of clinical practices further constrains the ability to evaluate actual service delivery. Geographic disparities in response rates, with an overrepresentation of optometrist from the central region, may have skewed results. One limitation of the study is the grouping of tools such as the Amsler grid and automated perimetry under a single category for visual field testing. While these tools differ in their clinical applications, the data was collected in this format during the survey. *Another limitation of this study is the predominance of early-career optometrists with relatively low patient volumes, which may not fully represent the perspectives of more experienced practitioners or those managing larger patient caseloads. Future studies should focus on these subgroups to gain a comprehensive understanding of low vision service needs*. And should consider distinguishing between these tools to provide a more nuanced understanding of their usage in low vision care. Employ randomized sampling, larger sample sizes, and mixed methodologies to provide a more comprehensive understanding.

Conclusion

This study highlights critical gaps in LV care in Saudi Arabia, including limited awareness, insufficient training, unequal service distribution, and barriers to access. The findings emphasize the need for enhanced practitioner education, expanded device availability, and public awareness campaigns to improve service delivery. Tailored interventions, such as genetic counseling and equitable resource allocation, are essential to address region-specific challenges like the high prevalence of hereditary conditions. By implementing these recommendations and fostering a multidisciplinary approach, Saudi Arabia can align its LV care with global standards, ultimately improving outcomes and quality of life for individuals with low vision.

Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate

Approval to conduct the study was sought and granted by the Institutional Review Board (IRB) of Taif University No. (HAPO-02-T-105). Informed consent was obtained from all subjects for participating in this study.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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