

Awareness, Knowledge, and Barriers to Low Vision Services Among Eye Care Practitioners

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Background: Low vision rehabilitation is an important component of comprehensive eye care for individuals whose visual function remains impaired despite conventional ophthalmic management. Eye care practitioners have a pivotal role in recognizing patients who may benefit from rehabilitation, providing appropriate low vision interventions, and facilitating timely referral. However, inadequate knowledge, training, resources, and awareness may limit effective service provision. This study assessed awareness and knowledge of low vision services among eye care practitioners and explored perceived barriers to service provision and patient uptake.

Methods: A cross-sectional survey was conducted among 100 eye care practitioners using a structured questionnaire. Information was collected regarding demographic and professional characteristics, frequency of low vision encounters, awareness and knowledge of World Health Organization (WHO) low vision criteria, provision of low vision devices, practitioner- and patient-level barriers, awareness of concession facilities, and strategies for improving low vision services. Descriptive statistics were used to summarize participant characteristics, knowledge, service provision, perceived barriers, and recommended interventions.

Results: All practitioners (100%) reported awareness of the WHO definition of low vision, and 98% recognized the relevance of visual acuity and visual-field assessment. However, only 60% reported using WHO-based criteria in clinical practice, while 59% and 60% correctly identified the specified visual-acuity and visual-field thresholds, respectively. This demonstrated an important gap between general awareness and application of specific clinical knowledge. Regarding service provision, 66% reported providing both optical and non-optical low vision devices, whereas 33% provided optical devices alone and 1% provided non-optical devices alone. Major practitioner-level barriers included inadequate awareness and training, limited motivation, time constraints, and device-related expense. Patient-level barriers prominently included inadequate awareness and motivation, service-related expense, and concerns regarding the cosmetic acceptability of devices. Awareness of concession facilities was reported by 82% of practitioners. A combined strategy incorporating public awareness, practitioner awareness, and professional training was the most frequently recommended approach (65%).

Conclusion: Although general awareness of low vision was high, substantial gaps remained in the recognition and clinical application of specific low vision criteria and in comprehensive service provision. Strengthening structured low vision education and continuing professional development, improving access to appropriate devices and referral pathways, and

increasing public awareness may help overcome practitioner- and patient-level barriers and facilitate greater integration of low vision rehabilitation into routine eye care.

Keywords: *Low vision, Low vision rehabilitation, Eye care practitioners, Optometry, Knowledge, Health services*

Introduction

Low vision is a major clinical and public health concern because persistent visual impairment can restrict functional independence and adversely affect daily activities, education, employment, and social participation. Low vision rehabilitation aims to reduce these functional limitations by maximizing residual visual function through comprehensive assessment, appropriate refractive correction, optical and non-optical interventions, environmental modification, counselling, rehabilitation, and referral. Effective rehabilitation therefore depends not only on the availability of services and devices but also on timely identification, appropriate counselling, and effective integration of rehabilitation within routine eye care. Eye care practitioners, particularly optometrists and ophthalmologists, are central to this pathway because they frequently identify individuals whose visual difficulties persist despite appropriate medical, surgical, or refractive management. Their ability to recognize patients who may benefit from low vision rehabilitation, understand relevant clinical criteria, recommend appropriate interventions, provide counselling, and initiate timely referral can influence access to rehabilitation. Importantly, general awareness of low vision should be distinguished from specific knowledge of clinical criteria and rehabilitation options, while knowledge itself does not necessarily translate into routine service provision. Evidence from the United Kingdom, for example, indicates that practitioners' confidence in low vision rehabilitation varies according to their involvement in low vision care, although many optometrists express interest in further professional learning (Gould et al., 2024). Similarly, studies from Switzerland and Australia have highlighted the importance of optometric involvement, referral, and coordination in facilitating access to low vision rehabilitation (Alam et al., 2025; Seifert & Nosch, 2024). International evidence demonstrates considerable heterogeneity in practitioners' knowledge, confidence, and provision of low vision services. In Saudi Arabia, AlShehri et al. (2025) reported that awareness of the World Health Organization (WHO) definition of low vision was higher among optometrists who had received formal low vision training; however, awareness did not consistently translate into provision of low vision services. Earlier Saudi research similarly identified important gaps in optometrists' knowledge, attitudes, and practices regarding low vision care (Ovenseri-Ogbomo & Alghamdi, 2021). In Pakistan, Arshad et al. (2024) identified inadequate training and limited availability of low vision devices as important barriers to rehabilitation, while also demonstrating the influence of practice setting and perceived economic feasibility on service provision. In Ghana, a nationwide survey further demonstrated that practitioner characteristics, training, resources, and the clinical environment influence the provision of low vision services (Akuffo et al., 2025). Evidence from Malaysia has likewise demonstrated gaps in knowledge of low vision criteria and familiarity with available devices among optometrists, with affordability and public awareness identified as important considerations for improving service delivery (Wong et al., 2025). The barriers to low vision service provision are consequently multidimensional. At the practitioner and service levels, inadequate formal training, limited clinical exposure, insufficient confidence, lack of appropriate equipment or assistive devices, uncertainty regarding referral pathways, time constraints, and organizational or economic limitations may restrict service delivery (Akuffo et al., 2025; Arshad et al., 2024; Ovenseri-Ogbomo & Alghamdi, 2021). At the patient level, limited awareness of rehabilitation, financial constraints, low motivation, and concerns regarding the acceptability or appearance of assistive devices may reduce uptake. The availability of rehabilitation technology does not necessarily overcome these barriers; recent evidence from Jordan indicates that adoption of electronic low vision aids may also be influenced by practitioner awareness, training, cost, and accessibility (Okasheh-Otoom, 2026). These findings suggest that improving low vision care requires an integrated approach combining practitioner education, continuing professional development, accessible resources, affordable devices, effective referral networks, and patient awareness.

The Indian context is particularly important because barriers to low vision service provision have been documented for more than two decades. Khan et al. (2005) identified substantial perceived barriers among ophthalmologists providing low vision services in India. Subsequently, Jose et al. (2016), in a multicentre survey of eye care practitioners across 12 Indian states, demonstrated important gaps in awareness and knowledge and identified barriers affecting both provision and uptake of low vision services. More recent evidence from Maharashtra has continued to identify inadequate awareness and training as important barriers among eye care practitioners (Dilkash et al., 2021), while research among Indian optometrists has demonstrated continuing gaps across knowledge, attitudes, and practice related to low vision care (Pandya et al., 2023). Collectively, these findings indicate that recognition of low vision as a clinical problem has not necessarily translated into consistent delivery of rehabilitation services. Despite this growing body of evidence, previous studies have often examined individual components of low vision care such as awareness, knowledge, attitudes, confidence, or service barriers within specific professional or geographic populations. Consequently, there remains a need for integrated assessment of general awareness, specific clinical knowledge, current service provision, perceived

practitioner- and patient-level barriers, awareness of available support mechanisms, and strategies for improving low vision care within a single practitioner population. Such evidence is particularly valuable for identifying modifiable gaps that can be addressed through undergraduate education, continuing professional development, service strengthening, and improved referral pathways.

Therefore, this study aimed to assess awareness, knowledge, and current practice regarding low vision services among eye care practitioners and to identify perceived barriers to their provision and uptake. The study also evaluated practitioners' awareness of available concession facilities and their perceptions of strategies for improving awareness and access to low vision rehabilitation. By examining the relationship between awareness, specific knowledge, practical service provision, and perceived barriers, the study seeks to identify actionable areas for strengthening practitioner education and improving the delivery and uptake of low vision rehabilitation services.

Materials and Methods

Study design and setting

A descriptive, cross-sectional, questionnaire-based survey was conducted to assess awareness, knowledge, practice patterns, and perceived barriers related to low vision (LV) services among eye care practitioners. The study was conducted from October 2022 to September 2023 at a Tertiary eye care centre, Ahmedabad, Gujarat, India. Data were collected using a structured, self-administered electronic questionnaire administered through Google Forms. The study included 100 eye care practitioners who completed the survey. The study was designed to examine not only whether practitioners were familiar with the concept of low vision, but also whether they possessed relevant clinical knowledge, encountered patients requiring low vision care, provided or recommended low vision services and devices, and recognized the practical and patient-related factors that could limit access to rehabilitation.

Study population and eligibility

The study population comprised practicing optometrists and ophthalmologists involved in clinical eye care. Practitioners were eligible if they were qualified eye care professionals, were engaged in clinical practice during the study period, and voluntarily agreed to participate in the survey. Participants who did not meet the professional eligibility criteria or who did not provide a completed questionnaire were not included in the final analytical sample. A total of 100 completed questionnaires were included in the final analysis. Of these, 83 participants (83.0%) were optometrists and 17 (17.0%) were ophthalmologists. Participants were drawn from different clinical practice settings, including hospitals, individual practices, and optical outlets.

Sampling and recruitment

A non-probability convenience sampling strategy was used. Eligible eye care practitioners were approached through professional and clinical networks and invited to participate in the electronic survey during the study period. The survey link was distributed electronically, and participation was voluntary. The online format allowed participants to complete the questionnaire independently and reduced the possibility of interviewer influence during administration. Practitioners who fulfilled the eligibility criteria and submitted a completed questionnaire were included in the final dataset. Because convenience sampling was used, the findings were interpreted as describing the characteristics and perceptions of the participating practitioners rather than as estimates necessarily representative of all eye care practitioners in India.

Questionnaire development

A structured questionnaire was developed to assess multiple dimensions of low vision care, including awareness, clinical knowledge, service provision, barriers, awareness of support mechanisms, and perceived strategies for improving low vision services. Questionnaire development was informed by previously published literature addressing low vision awareness, knowledge, attitudes, practice patterns, and barriers among eye care professionals. The questionnaire underwent expert review and validation before administration to the study participants. The final instrument was designed to be concise and suitable for self-administration in an electronic format. It was administered in English.

The questionnaire was divided into three broad sections: (1) demographic and professional characteristics, (2) awareness of low vision, and (3) knowledge, practice, and perceived barriers related to low vision services.

Questionnaire domains

Demographic and professional characteristics

The first section collected information regarding participants' demographic and professional characteristics. Variables included age, sex, professional qualification, clinical practice setting, and professional exposure to patients with low vision. These variables were collected to characterize the participating practitioners and explore differences in awareness and practice according to professional background and clinical exposure.

Awareness of low vision

The second section evaluated participants' general awareness of low vision and low vision rehabilitation. Particular attention was given to awareness of the World Health Organization (WHO) definition of low vision, awareness of rehabilitation services, and awareness of available support or concession facilities for individuals with visual impairment. Awareness of concession facilities was assessed because financial and social-support mechanisms may influence the ability of individuals with visual impairment to obtain rehabilitation services and assistive devices. Participants were asked about awareness of different forms of support, including travel concessions, employment-related reservation, bank loans, and pension-related benefits.

Knowledge of low vision

The knowledge component assessed participants' understanding of clinically relevant aspects of low vision. Questions addressed recognition of low vision according to visual function, relevant visual-acuity and visual-field considerations, low vision rehabilitation, and the role of optical and non-optical devices.

The assessment was intended to distinguish specific clinical knowledge from general awareness. This distinction was considered important because familiarity with the term “low vision” does not necessarily indicate an ability to identify patients who require rehabilitation or to recommend appropriate interventions.

Low vision practice and service provision

Participants were asked about their practical involvement in low vision care, including their exposure to patients with low vision, provision or recommendation of low vision devices, and involvement in low vision rehabilitation or referral. Practice-related responses were analyzed independently from knowledge measures to avoid assuming that higher knowledge automatically translates into clinical service provision.

Perceived barriers to low vision service provision

Perceived barriers were assessed from both practitioner and patient perspectives.

Practitioner-level barriers included factors such as:

- inadequate awareness of low vision services;
- insufficient training;
- lack of motivation;
- lack of appropriate equipment or devices;
- cost of low vision devices;
- time requirements associated with low vision assessment and rehabilitation; and
- other practical limitations affecting service provision.

Patient-level barriers included:

- inadequate awareness of low vision rehabilitation;
- limited motivation;
- financial constraints;
- cost of services;
- concerns regarding the appearance or cosmetic acceptability of assistive devices; and
- other factors perceived to reduce uptake of rehabilitation services.

The questionnaire therefore considered barriers as a multilevel phenomenon, recognizing that limitations in low vision care may arise from practitioner, service, economic, and patient-related factors rather than from knowledge deficits alone.

Strategies for improving low vision services

Participants were additionally asked to identify strategies that they believed could improve awareness, referral, and uptake of low vision services. These included improving practitioner awareness, increasing public awareness, providing additional professional training, and strengthening access to low vision resources.

Knowledge scoring

Knowledge was assessed using predefined questionnaire items addressing the clinical recognition of low vision, relevant visual-acuity and visual-field considerations, rehabilitation services, and low vision devices.

For objectively scored knowledge questions, a correct response was assigned 1 point, whereas an incorrect or “don't know” response was assigned 0 points. The resulting score represented the proportion of correctly answered knowledge items.

Where a composite knowledge score was calculated, it was expressed as a percentage using:

For analytical interpretation, knowledge was categorized as:

- Good knowledge: $\geq 75\%$
- Moderate knowledge: 50–74%
- Poor knowledge: $< 50\%$

Practice-related responses, including actual provision of low vision services, use or recommendation of low vision devices, and referral practices, were analyzed separately from the knowledge score.

This separation was intentional because knowledge, awareness, and clinical practice represent related but distinct constructs. A practitioner may demonstrate adequate knowledge while still being unable to provide low vision services because of equipment, financial, organizational, or referral-related constraints.

Data collection procedure

The questionnaire was administered electronically using Google Forms. The survey link was provided to eligible practitioners through professional and clinical networks. Participants completed the questionnaire independently without direct interviewer assistance.

Data collection was conducted between October 2022 and September 2023. The final dataset consisted of 100 completed questionnaires.

The electronic questionnaire format enabled standardized administration of the study instrument and facilitated collection of responses across practitioners working in different clinical settings.

Study outcomes

The primary outcomes were:

1. awareness of low vision and low vision rehabilitation;
2. knowledge of clinically relevant low vision criteria and rehabilitation;
3. reported provision or involvement in low vision services; and
4. perceived barriers to low vision service provision and patient uptake.

Secondary outcomes included:

1. awareness of concession and support facilities;
2. awareness of low vision devices;
3. exposure to patients requiring low vision care;
4. perceived strategies for improving practitioner and public awareness; and
5. differences in awareness, knowledge, and practice according to professional and clinical characteristics.

Statistical analysis

Data were analyzed using descriptive statistical methods. Categorical variables were summarized using frequencies and percentages. Continuous variables, where applicable, were summarized using appropriate measures of central tendency and dispersion.

Responses to individual questionnaire items were summarized to describe the distribution of awareness, knowledge, practice patterns, perceived barriers, concession awareness, and proposed strategies for improving low vision services. The knowledge score was summarized as a percentage and categorized into good, moderate, and poor knowledge according to the predefined scoring framework described above.

Where comparisons between participant characteristics and categorical questionnaire outcomes were undertaken, the chi-square test or Fisher's exact test, as appropriate, was used. For comparisons involving continuous variables, the statistical test was selected according to the distribution and measurement characteristics of the variable.

All statistical tests were two-sided, and a p-value <0.05 was considered statistically significant. Missing responses were not interpreted as correct responses and were excluded from the denominator for the relevant item-level analysis where applicable.

Ethical considerations and informed consent

The study involved human participants and was conducted in accordance with the ethical principles applicable to research involving human participants.

Ethical approval was obtained from the institutional ethics committee before commencement of data collection. Participation was voluntary, and participants were informed about the purpose of the study and the nature of their participation before completing the questionnaire.

Confidentiality and data protection

Participant information was handled confidentially and analyzed in aggregate form. No individual participant was identified in the reporting of the study findings. Data were used exclusively for the stated research purposes and were accessible only to the study investigators.

The final manuscript should specify whether the electronic questionnaire was anonymous and whether identifying information such as names, email addresses, or other directly identifiable information was collected.

Results

Participant characteristics

A total of 100 eye care practitioners participated in the study. The demographic and professional characteristics of the participants are summarized in **Table 1**. Women constituted 62.0% (n = 62) of the sample, while men accounted for 38.0% (n = 38). The participants were predominantly young practitioners, with 62.0% (n = 62) aged 18–28 years and 32.0% (n = 32) aged 29–38 years. Only 5.0% (n = 5) were aged 39–48 years and 1.0% (n = 1) was aged 49–58 years.

Optometrists constituted the majority of the sample (83.0%, n = 83), while ophthalmologists represented 17.0% (n = 17). With respect to practice setting, 59.0% (n = 59) worked in hospitals, 17.0% (n = 17) in individual practice, and 24.0% (n = 24) in optical outlets (**Figure 1A–D**).

Table 1. Demographic and professional characteristics of participants

Characteristic	n	%	95% CI
Sex			
Female	62	62.0	52.0–71.3
Male	38	38.0	28.7–48.0
Age group, years			
18–28	62	62.0	52.0–71.3
29–38	32	32.0	23.0–42.0
39–48	5	5.0	1.6–11.3
49–58	1	1.0	0.0–5.4
Qualification			
Optometrist	83	83.0	73.9–89.8
Ophthalmologist	17	17.0	10.2–26.1
Practice setting			
Hospital	59	59.0	48.7–68.7
Individual practice	17	17.0	10.2–26.1
Optical outlet	24	24.0	16.0–33.6

Note: 95% CIs are exact binomial confidence intervals.

The sample was therefore characterized by a predominance of young optometrists and hospital-based practitioners, with optometrists comprising almost five times as many participants as ophthalmologists.

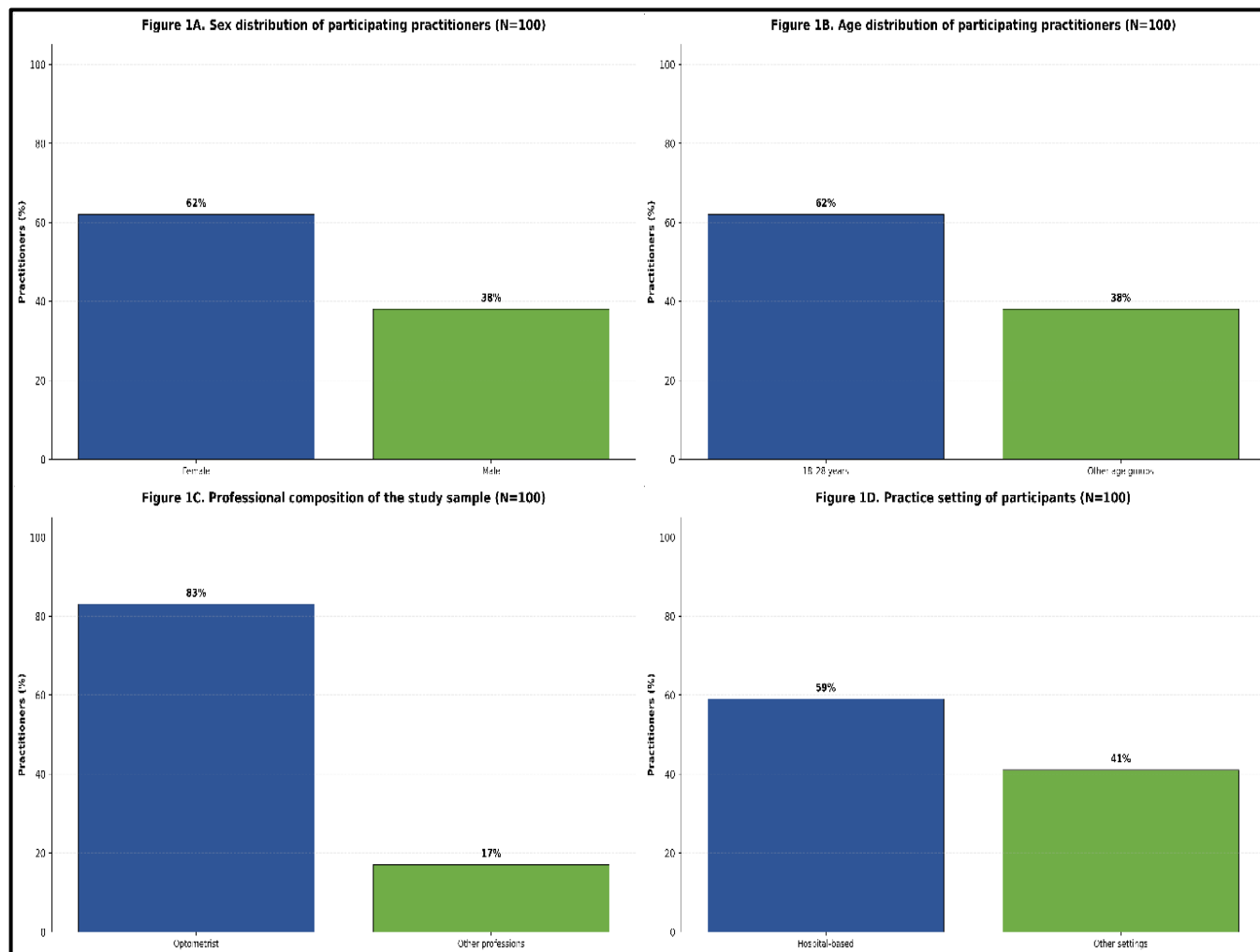


Figure 1. Demographic and professional characteristics of participating eye care practitioners (N = 100). (A) Sex distribution, (B) Age distribution, (C) Professional composition, and (D) Practice setting of the study participants. Frequency of encounters with patients with low vision

Regular clinical exposure to patients with low vision was limited. Thirty-nine practitioners (39.0%; 95% CI, 29.4–49.3%) reported that patients with low vision visited their practice often, whereas 60 practitioners (60.0%; 95% CI, 49.7–69.7%) reported that such patients rarely visited. One practitioner (1.0%; 95% CI, 0.0–5.4%) reported never encountering patients with low vision. The distribution of low vision encounters is presented in Table 2 and Figure 2.

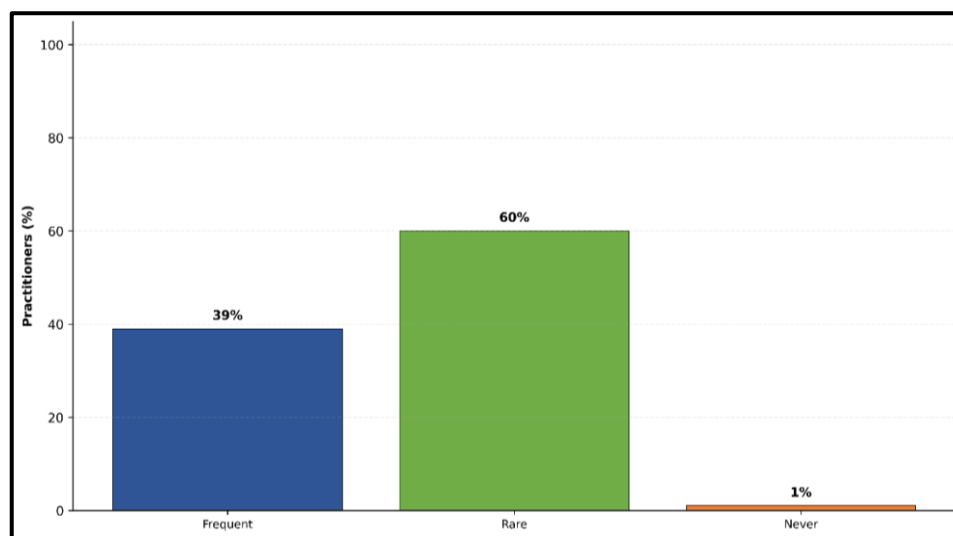


Figure 2. Frequency of low vision encounters among participating eye care practitioners (N = 100).

Table 2. Frequency of encounters with patients with low vision

Frequency	n	%	95% CI
Often	39	39.0	29.4–49.3
Rarely	60	60.0	49.7–69.7
Never	1	1.0	0.0–5.4
Total	100	100.0	

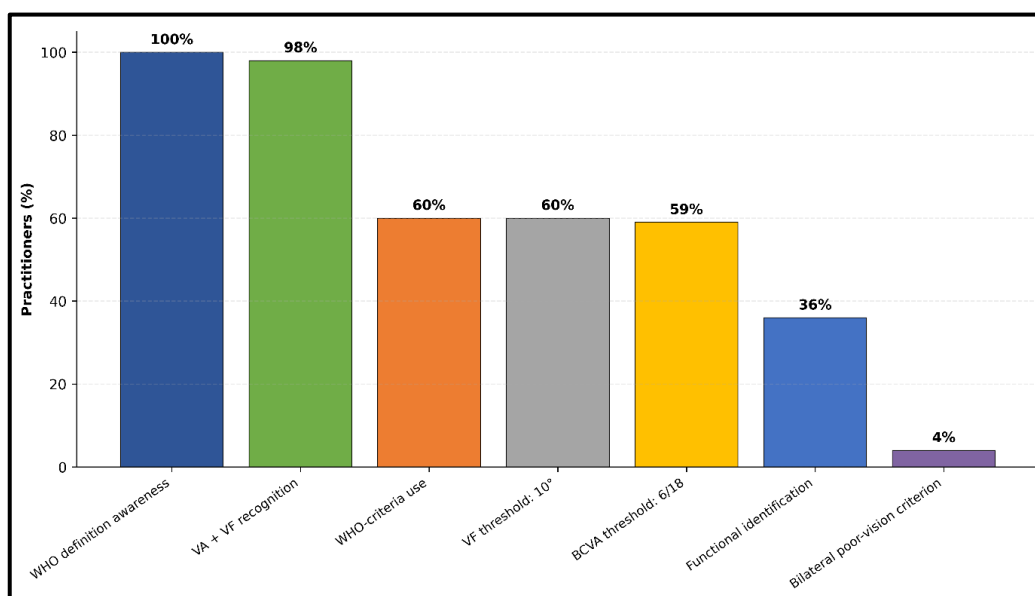
Thus, 61.0% of practitioners reported either rare or no exposure to patients with low vision, compared with only 39.0% reporting frequent exposure. This represents an absolute 22-percentage-point difference between frequent and infrequent/no exposure.

Awareness of the WHO definition and clinical identification of low vision

All participants (100.0%, $n = 100$; 95% CI, 96.4–100.0%) reported awareness of the WHO definition of low vision. However, awareness did not translate uniformly into application of standardized criteria. Only 60 practitioners (60.0%; 95% CI, 49.7–69.7%) reported identifying low vision according to WHO criteria. Thirty-six practitioners (36.0%; 95% CI, 26.7–46.2%) reported relying primarily on patients' functional needs, whereas 4 (4.0%; 95% CI, 1.1–9.9%) used poor vision in both eyes as the basis for identification (Table 3; Figure 3).

Table 3. Awareness and approach to identification of low vision

Response	n	%	95% CI
Aware of WHO definition	100	100.0	96.4–100.0
Uses WHO criteria	60	60.0	49.7–69.7
Uses patients' functional needs	36	36.0	26.7–46.2
Uses poor vision in both eyes	4	4.0	1.1–9.9

**Figure 3. Awareness and specific knowledge of low vision among participating eye care practitioners (N = 100).**

Awareness–application gap

An important finding was the 40-percentage-point gap between general awareness of the WHO definition (100%) and reported use of WHO criteria in clinical identification (60%). This indicates that universal self-reported awareness did not correspond to universal application of standardized criteria.

Recognition of visual acuity and visual-field parameters

When asked which clinical parameters should be used to identify low vision, 98 practitioners (98.0%; 95% CI, 93.0–99.8%) selected both visual acuity and visual field, whereas 2 (2.0%; 95% CI, 0.2–7.0%) selected visual acuity alone (Table 4).

Table 4. Clinical parameters considered relevant to low vision assessment

Parameter	n	%	95% CI
Visual acuity only	2	2.0	0.2–7.0
Visual acuity + visual field	98	98.0	93.0–99.8
Total	100	100.0	

Although recognition of the two principal clinical parameters was almost universal, knowledge became less consistent when participants were asked to identify the specific clinical thresholds.

Knowledge of best-corrected visual acuity criterion

The reported BCVA threshold varied considerably across participants. Fifty-nine practitioners (59.0%; 95% CI, 48.7–68.7%) selected a BCVA worse than 6/18, which was the criterion specified in the study questionnaire. Other participants selected worse than 6/60 (15.0%), 3/60 (11.0%), 6/36 (9.0%), or 1/60 (6.0%) (Table 5).

Table 5. Reported BCVA threshold for identifying low vision

BCVA threshold	n	%
Worse than 1/60	6	6.0
Worse than 3/60	11	11.0
Worse than 6/60	15	15.0
Worse than 6/36	9	9.0
Worse than 6/18	59	59.0
Total	100	100.0

The proportion selecting the specified threshold was therefore 59.0%, leaving 41.0% selecting alternative thresholds. This represents a substantial 41-percentage-point knowledge gap, despite the fact that all participants reported awareness of the WHO definition.

Knowledge of visual-field criterion

Similarly, 60 practitioners (60.0%; 95% CI, 49.7–69.7%) selected 10° as the visual-field criterion. Twenty-seven (27.0%) selected 20°, 8 (8.0%) selected 30°, and 5 (5.0%) were unsure (Table 6).

Table 6. Reported visual-field criterion

Visual-field criterion	n	%
10°	60	60.0
20°	27	27.0
30°	8	8.0
Not sure	5	5.0
Total	100	100.0

Accordingly, 40.0% of participants either selected an alternative threshold or were uncertain.

Combined clinical-knowledge finding

The discrepancy between broad and specific knowledge was particularly evident when the three clinically relevant measures were considered together:

Knowledge indicator	Correct/target response (%)
Recognized both VA and VF	98.0%
Selected specified BCVA threshold	59.0%
Selected specified VF threshold	60.0%

Thus, recognition of the general assessment framework (98%) exceeded recognition of the specified BCVA and visual-field thresholds by 39 and 38 percentage points, respectively. This pattern suggests that conceptual awareness was substantially higher than specific criterion-level knowledge.

Low vision devices provided

Regarding rehabilitation devices, 66 practitioners (66.0%; 95% CI, 55.8–75.2%) reported providing both optical and non-optical devices. Thirty-three (33.0%) reported providing optical devices only, while 1 (1.0%) reported providing non-optical devices alone (Table 7; Figure 4).

Table 7. Types of low vision devices provided

Device type	n	%	95% CI
Optical devices only	33	33.0	23.9–42.8
Non-optical devices only	1	1.0	0.0–5.4
Both optical and non-optical	66	66.0	55.8–75.2
Total	100	100.0	

Two-thirds of practitioners therefore reported providing a combination of optical and non-optical devices. However, this finding should be interpreted as reported device provision, rather than evidence of comprehensive multidisciplinary low vision rehabilitation.

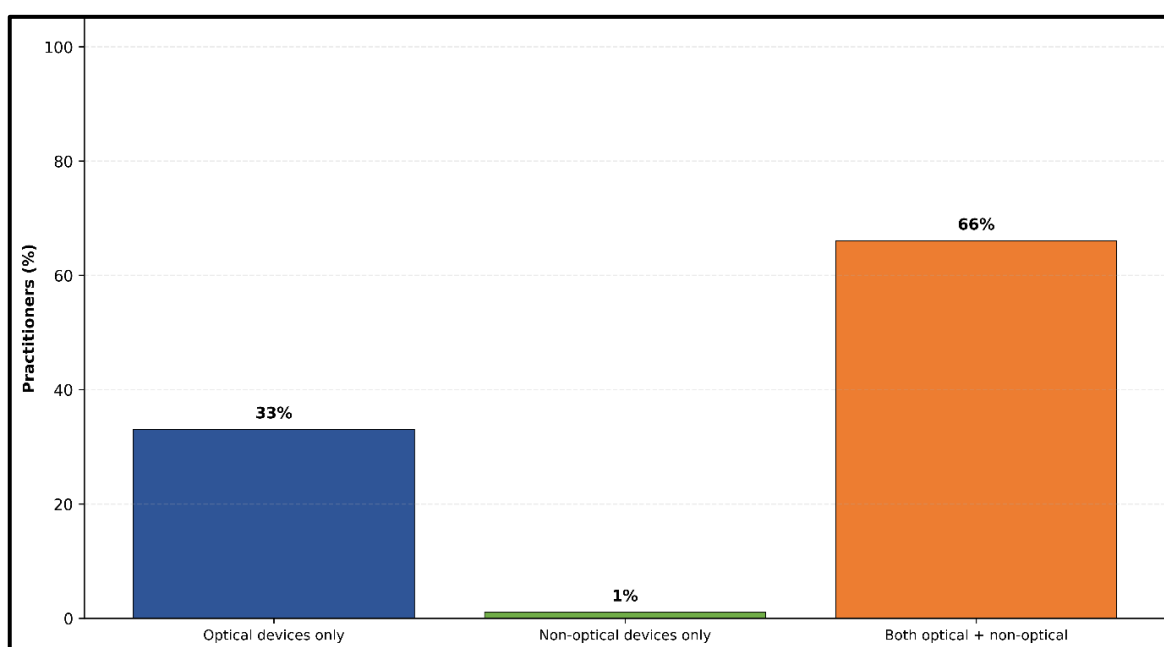


Figure 4. Types of low vision devices provided by participating practitioners (N = 100).

Practitioner-level barriers to low vision service provision

Practitioners reported multiple interacting barriers rather than a single dominant obstacle. The most frequently reported combination was lack of awareness, inadequate training, lack of motivation, time requirements, and device expense, reported by 37 practitioners (37.0%; 95% CI, 27.6–47.2%). A further 23 (23.0%) reported lack of awareness, training, motivation, and device expenses, while 21 (21.0%) identified lack of awareness, training, and motivation. The remaining 19.0% reported one or two other barriers (Table 8; Figure 5).

Table 8. Major practitioner-perceived barriers

Barrier pattern	n	%	95% CI
Awareness + training + motivation + time + device expense	37	37.0	27.6–47.2
Awareness + training + motivation + device expense	23	23.0	15.1–32.5
Awareness + training + motivation	21	21.0	13.5–30.4
Other one/two barriers	19	19.0	11.9–28.1
Total	100	100.0	

Notably, 81.0% of practitioners were represented in the three major response categories that explicitly included awareness, training, and motivation. This suggests that educational and motivational factors were recurrent components of perceived barriers, while financial and time-related constraints further compounded these difficulties.

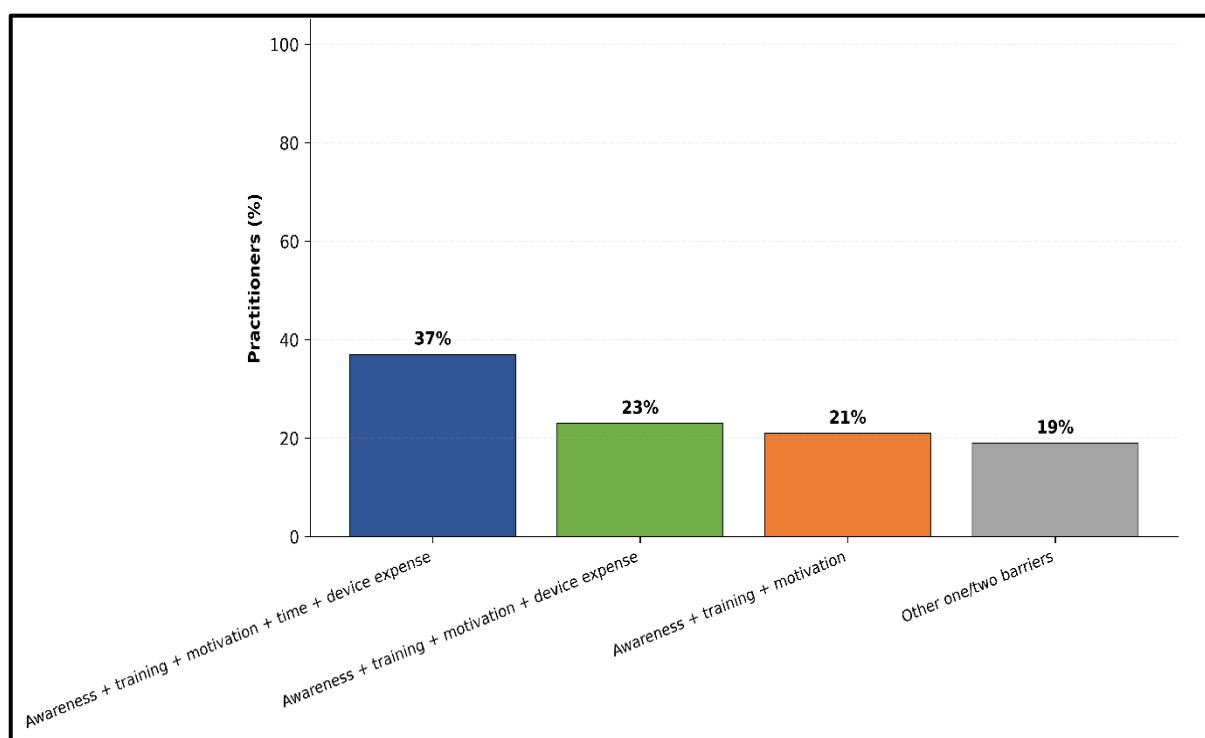


Figure 5. Practitioner-perceived barriers to the provision of low vision services (N = 100).

Patient-level barriers to accessing low vision services

Practitioners also identified multiple barriers affecting patient uptake of low vision services. The most frequently reported combination was lack of awareness, lack of motivation, expensive services, and cosmetic unacceptability, selected by 41 practitioners (41.0%; 95% CI, 31.3–51.3%). Twenty-three practitioners (23.0%) identified lack of awareness, motivation, and expensive services, while 20 (20.0%) identified lack of awareness and motivation (**Table 9; Figure 6**).

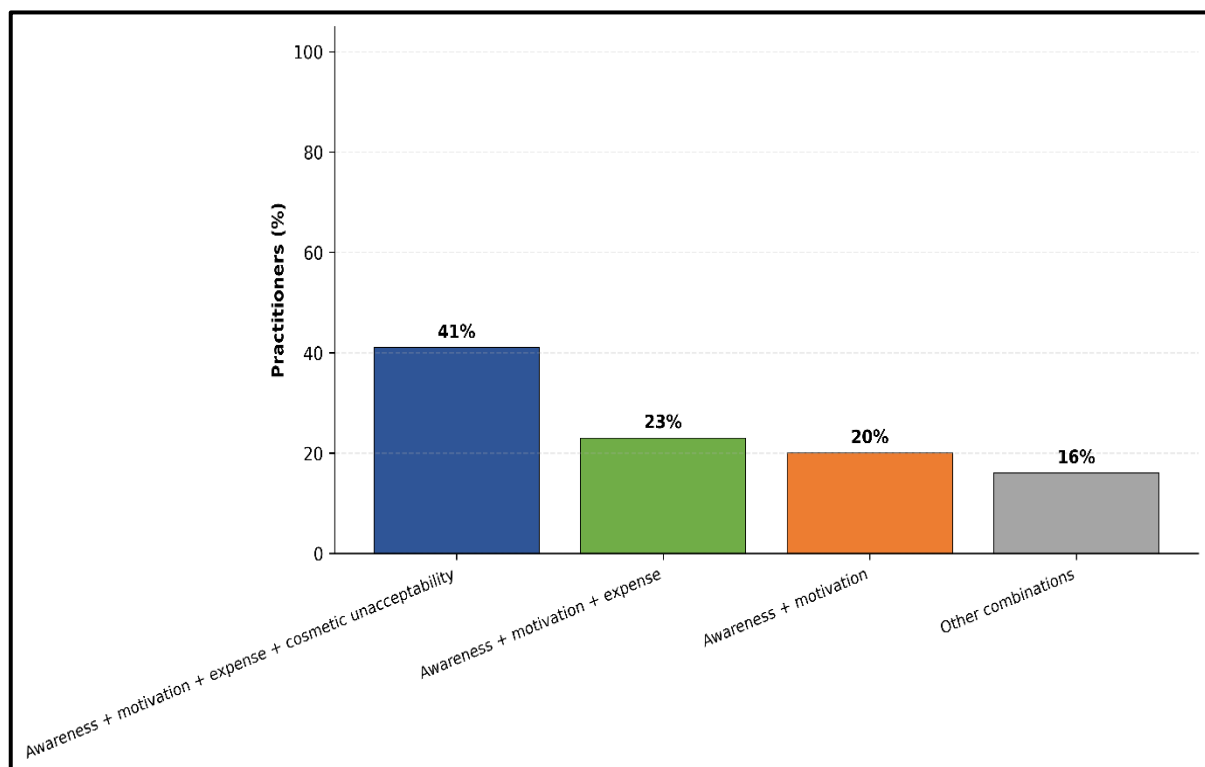


Figure 6. Practitioner-perceived barriers affecting patient uptake of low vision services (N = 100).

Table 9. Practitioner-perceived patient barriers

Barrier pattern	n	%	95% CI
Awareness + motivation + expensive services + cosmetic unacceptability	41	41.0	31.3–51.3
Awareness + motivation + expensive services	23	23.0	15.1–32.5
Awareness + motivation	20	20.0	12.9–29.3
Other combinations	16	16.0	9.8–24.6
Total	100	100.0	

The findings indicate that patient-level barriers were predominantly multidimensional, combining informational, motivational, economic, and social/acceptability factors. The most frequently selected comprehensive barrier combination (41%) was 4.1 percentage points higher than the corresponding most frequently reported practitioner-level barrier combination (37%), although this is a descriptive difference and should not be interpreted as statistically significant without participant-level paired analysis.

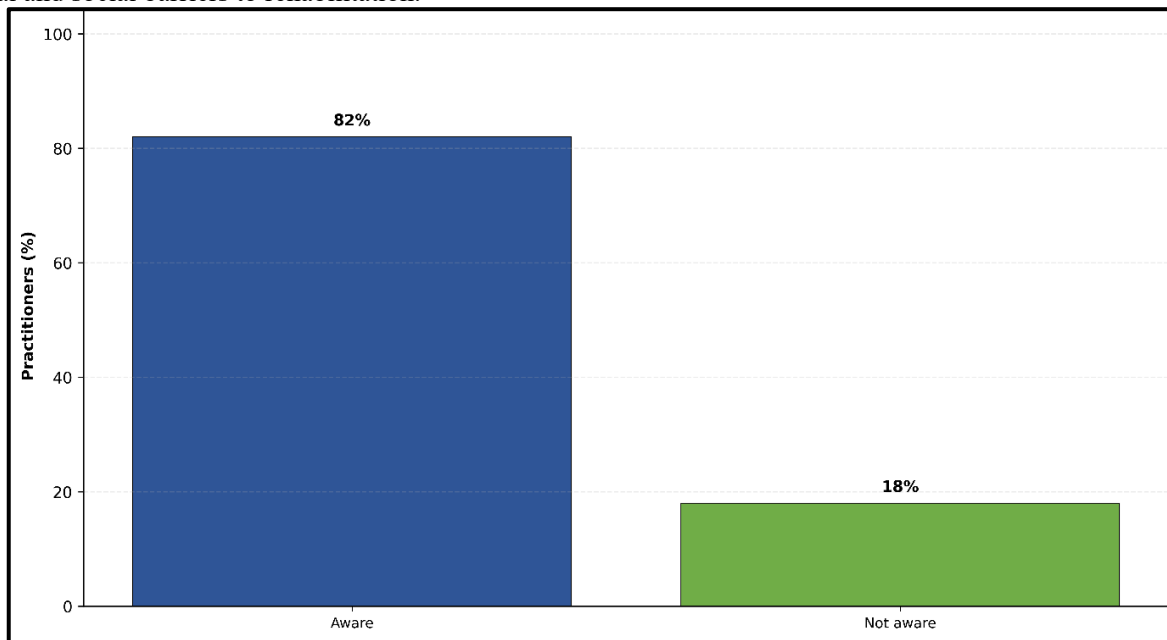
Awareness of concession facilities

Awareness of concession facilities was reported by 82 practitioners (82.0%; 95% CI, 73.1–89.0%), whereas 18 (18.0%) reported no awareness (Table 10; Figure 7).

Table 10. Awareness of concession facilities

Awareness status	n	%	95% CI
Aware	82	82.0	73.1–89.0
Not aware	18	18.0	11.0–26.9
Total	100	100.0	

Although awareness of concessions was considerably higher than awareness of the specific clinical thresholds, 18% of practitioners remained unaware of these facilities, representing a potentially important missed opportunity for addressing financial and social barriers to rehabilitation.

**Figure 7. Awareness of concession facilities among participating eye care practitioners (N = 100).**

Recommended strategies for improving low vision awareness and service delivery

A multifaceted approach was strongly preferred. Sixty-five practitioners (65.0%; 95% CI, 54.8–74.3%) recommended combining public awareness, practitioner awareness, and structured training programmes. Public awareness alone was selected by 17 (17.0%), while 11 (11.0%) recommended public awareness combined with training. Other single or combined strategies accounted for the remaining 7% (Table 11; Figure 8).

Table 11. Recommended strategies for improving awareness of low vision services

Strategy	n	%	95% CI
Public + practitioner awareness + training	65	65.0	54.8–74.3
Public awareness only	17	17.0	10.2–26.1
Public awareness + training	11	11.0	5.6–18.9
Practitioner awareness only	2	2.0	0.2–7.0
Training programme only	2	2.0	0.2–7.0
Practitioner awareness + training	2	2.0	0.2–7.0
Public + practitioner awareness	1	1.0	0.0–5.4
Total	100	100.0	

The preference for a combined strategy was therefore substantial: the 65% selecting the comprehensive approach exceeded the next most common single strategy by 48 percentage points.

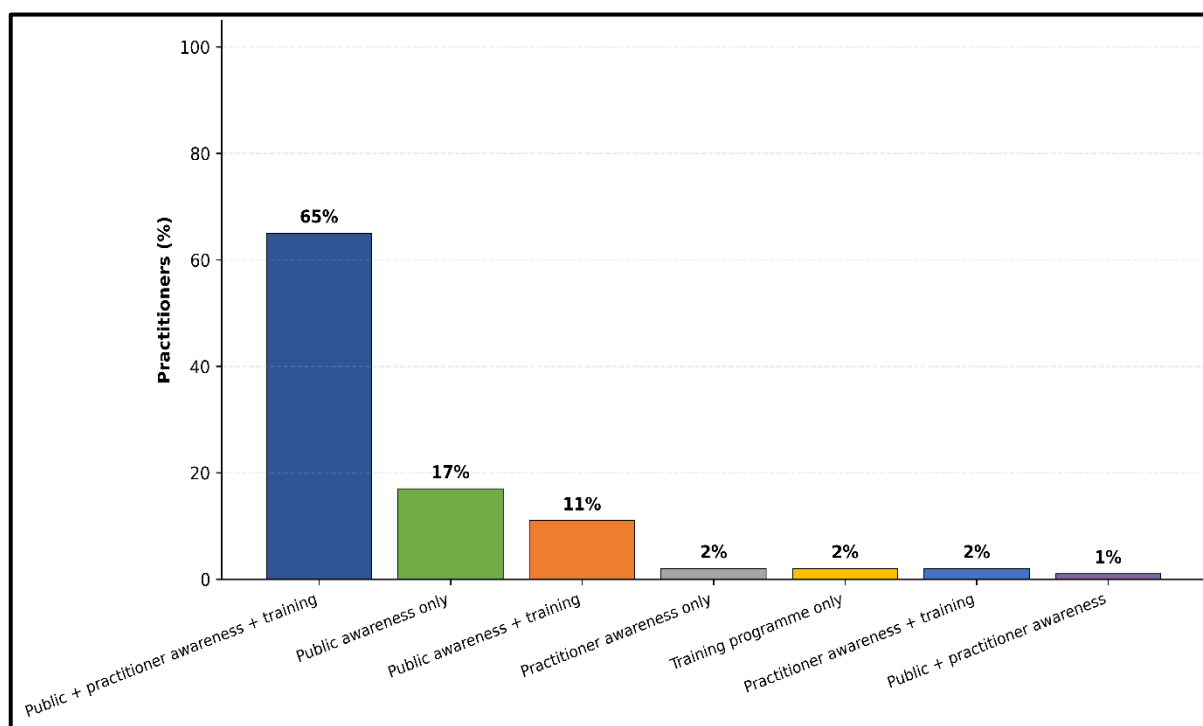


Figure 8. Practitioner-recommended strategies for improving awareness and provision of low vision services (N = 100).

Integrated knowledge and service-provision analysis

A key finding of the study was the discrepancy between general awareness, specific knowledge, and reported clinical practice (Table 12; Figure 9).

Table 12. Awareness-to-practice gradient

Domain	n	%	Interpretation
Aware of WHO definition	100	100.0	Universal general awareness
Recognized both VA and VF	98	98.0	Very high conceptual awareness
Uses WHO criteria for identification	60	60.0	Moderate application
Selected specified BCVA threshold	59	59.0	Moderate specific knowledge
Selected specified VF threshold	60	60.0	Moderate specific knowledge
Provides both optical and non-optical devices	66	66.0	Moderate reported service provision
Aware of concession facilities	82	82.0	Relatively high support-system awareness

The findings reveal a clear awareness-knowledge-practice gradient. General awareness was highest (100%), followed by recognition of relevant clinical parameters (98%), awareness of concession facilities (82%), reported provision of both

types of devices (66%), and application of standardized WHO criteria (60%). Specific knowledge of the specified BCVA and visual-field thresholds was similarly limited (59% and 60%, respectively).

The absolute difference between general WHO awareness and standardized WHO-criteria application was 40 percentage points, while the difference between recognition of both VA/VF and correct identification of the specified BCVA threshold was 39 percentage points.

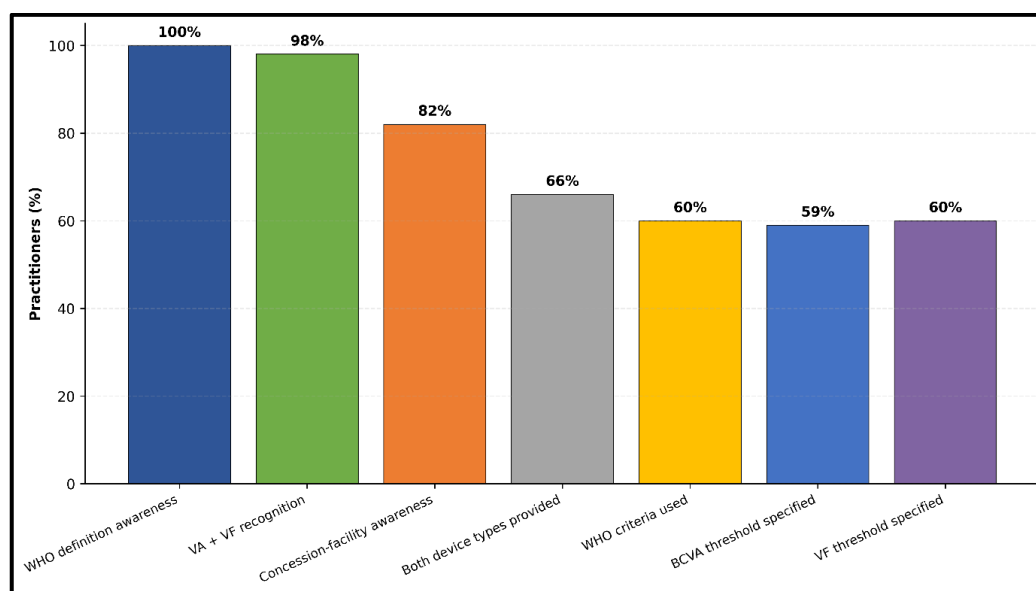


Figure 9. Awareness-to-practice gradient in low vision care among participating eye care practitioners (N = 100).

Overall interpretation of the findings

The study demonstrated high general awareness but substantial gaps in criterion-specific knowledge and standardized clinical application. Although all practitioners reported awareness of the WHO definition and 98% recognized both visual acuity and visual field as relevant parameters, only approximately three-fifths reported using WHO criteria and selected the specified BCVA and visual-field thresholds. The findings therefore suggest that awareness of low vision as a clinical concept should not be equated with competency in applying specific diagnostic criteria. The 40-percentage-point gap between awareness of the WHO definition and reported use of WHO criteria is particularly notable. Reported service provision was also incomplete: although 66% reported providing both optical and non-optical devices, practitioners identified substantial barriers involving training, awareness, motivation, time, and device costs. Patient access was perceived to be constrained by a similarly complex combination of awareness, motivation, cost, and cosmetic acceptability. Finally, the strong preference for a combined intervention public awareness, practitioner awareness, and structured training suggests that participants viewed low vision service improvement as a multilevel healthcare-system issue rather than solely an individual practitioner knowledge problem.

Discussion

The principal finding of this study was a clear gap between general awareness of low vision and its translation into standardized clinical assessment and comprehensive rehabilitation. Although awareness of low vision was high among participating eye care practitioners, substantially fewer demonstrated criterion-specific knowledge or reported consistent application of standardized criteria. Similarly, although approximately two-thirds reported providing optical and non-optical devices, device provision alone does not necessarily indicate comprehensive rehabilitation. These findings suggest that the major challenge is not simply recognition of low vision, but whether practitioners possess the knowledge, confidence, resources, and referral pathways required to deliver effective, patient-centred care.

Awareness and clinical knowledge

The high general awareness observed in the present study is encouraging; however, the difference between awareness and specific knowledge is clinically important. Jose et al. (2016), in a multicentre Indian survey of 211 eye care practitioners, reported good awareness among 55.9% and good knowledge among only 30.4% of respondents. Similarly, AlShehri et al. (2025), in a nationwide survey of 275 Saudi optometrists, found that 70.1% were aware of the WHO definition of low

vision, whereas only 41.5% reported following WHO criteria when categorizing patients. The present findings therefore support an international pattern in which recognition of low vision is considerably more common than accurate application of standardized criteria. This distinction is important because awareness alone does not demonstrate the ability to classify patients correctly, assess functional vision, select appropriate interventions, or initiate timely rehabilitation. Similar concerns have been reported in India. Dilkash et al. (2021) identified persistent gaps in awareness and knowledge among practitioners in Maharashtra, while Pandya et al. (2023) reported limitations in knowledge, attitudes, and practices among Indian optometrists. In Saudi Arabia, Ovenseri-Ogbomo and Alghamdi (2021) also found considerable variation in knowledge and clinical practice. In Pakistan, Arshad et al. (2024) identified lack of training and device availability as important barriers despite relatively high awareness of low vision. The difference between recognizing what should be assessed and knowing how clinical findings should be interpreted was particularly evident in the present study. Almost all participants recognized visual acuity and visual field as relevant parameters, whereas recognition of specified thresholds was considerably lower. This suggests that continuing professional development should move beyond general awareness and focus on standardized criteria, functional assessment, interpretation of clinical findings, device selection, counselling, rehabilitation, and referral.

Service provision and rehabilitation

Approximately two-thirds of practitioners in the present study reported providing both optical and non-optical low vision devices. Although this indicates substantial involvement in low vision care, it should not be equated with comprehensive rehabilitation, which also requires individualized functional assessment, goal setting, device training, counselling, follow-up, and appropriate referral. International studies demonstrate considerable variation in service provision. In Saudi Arabia, AlShehri et al. (2025) reported that only 36.4% of optometrists provided low vision care in their primary practice. In Ghana, Akuffo et al. (2025) found that 77% of optometrists did not provide low vision services. Wong et al. (2025) similarly identified deficiencies in familiarity with low vision criteria and available devices among optometrists in the Klang Valley. These differences may reflect variations in practitioner characteristics, healthcare systems, available resources, questionnaire design, and definitions of service provision; therefore, direct comparisons should be made cautiously. Nevertheless, the evidence collectively indicates that awareness does not consistently translate into comprehensive rehabilitation. Evidence from higher-resource settings reinforces this interpretation. Gould et al. (2024) reported lower confidence in low vision rehabilitation among UK optometrists who were not routinely involved in low vision services, although many expressed interest in further learning. Seifert and Nosch (2024) identified differences between ophthalmologists and optometrists in referral to low vision counselling services in Switzerland, while Alam et al. (2025) highlighted communication and access to rehabilitation services as important issues in Australia. Thus, practitioner exposure, confidence, and integration within referral networks may remain important even where healthcare infrastructure is relatively well developed. Jin and Yi (2016) similarly demonstrated differences in perceptions of low vision rehabilitation among professional groups in Korea.

Training and system-level barriers

Training emerged as an important theme in the present study and is strongly supported by previous evidence. AlShehri et al. (2025) found substantially higher awareness among Saudi optometrists with formal low vision training, while Gould et al. (2024) demonstrated lower confidence among UK optometrists without routine involvement in low vision rehabilitation. These findings support structured education and continuing professional development as important components of service improvement. However, training alone is unlikely to be sufficient. Akuffo et al. (2025) identified equipment limitations and other logistical constraints as important barriers to service provision in Ghana. Arshad et al. (2024) similarly reported lack of training and device availability as major barriers in Pakistan. Khan et al. (2005) identified lack of training or knowledge, lack of awareness, and non-availability of devices among the leading barriers reported by Indian ophthalmologists.

The persistence of similar barriers across countries suggests that low vision under-provision is better understood as a multilevel health-system problem rather than an isolated educational deficit. Effective improvement therefore requires training to be accompanied by appropriate equipment, affordable devices, adequate consultation time, and accessible referral pathways.

Patient-centred barriers and accessibility

The patient-level barriers identified in the present study including lack of awareness and motivation, financial constraints, and cosmetic concerns are consistent with previous research. Jose et al. (2016), Arshad et al. (2024), and Akuffo et al. (2025) similarly identified patient awareness, affordability, and access to devices or services as important barriers. These findings reinforce that low vision rehabilitation should be viewed as patient-centred functional care rather than simply device prescription. Practitioners should consider patients' functional goals, occupation, environment, financial

circumstances, expectations, and ability to use prescribed interventions. Counselling, device training, and follow-up should therefore be integral components of rehabilitation. Public awareness is also important. Li et al. (2025) highlighted the need to improve public awareness of low vision rehabilitation in China. Practitioner-level improvements may have limited impact if patients do not recognize the availability or potential benefits of rehabilitation.

Referral, financial support, and emerging technology

Stronger referral networks are essential because not all practitioners or facilities can provide comprehensive rehabilitation. Evidence from Australia (Alam et al., 2025) and Switzerland (Seifert & Nosch, 2024) highlights the importance of communication and coordination between eye care providers and rehabilitation services. A practical model should therefore link identification, standardized assessment, initial management, specialist referral, and multidisciplinary follow-up. The present study also assessed awareness of concession facilities. Although most practitioners were aware of such support, a proportion remained unaware. This is relevant because financial barriers can substantially influence access to devices and rehabilitation. Broader evidence demonstrates that financial, geographic, and health-system barriers frequently interact in low- and middle-income settings (Bhattacharjee & Varshney, 2025; Bhattacharjee et al., 2026). Evidence from tribal populations in Gujarat and Maharashtra further illustrates the importance of geographic and population-level inequities in eye-care access (Varshney & Pavar, 2024). Emerging technologies may expand rehabilitation options but also introduce additional requirements for training, affordability, and implementation. Smart vision glasses and other assistive technologies have demonstrated potential for people with severe visual impairment (Varshney et al., 2025; Varshney, 2025). However, Okasheh-Otoom (2026) demonstrated that adoption of electronic low vision aids is influenced by barriers involving awareness, training, cost, and practical implementation. Thus, technology should complement not replace individualized clinical assessment and rehabilitation.

Implications for practice

The findings support a shift from awareness-based education to competency-based low vision training. Educational programmes should address standardized criteria, functional vision assessment, visual-acuity and visual-field interpretation, optical and non-optical devices, emerging technologies, counselling, device training, referral criteria, and awareness of financial support. However, educational interventions should be accompanied by service-level improvements, including appropriate equipment, affordable assistive devices, adequate clinical time, dedicated rehabilitation services, and clearly defined referral pathways. This integrated approach is more likely to improve service delivery than isolated training programmes (Akuffo et al., 2025; AlShehri et al., 2025; Wong et al., 2025).

Strengths and limitations

A major strength of this study is its multidimensional assessment of low vision care, encompassing awareness, criterion-specific knowledge, reported practice, device provision, practitioner- and patient-level barriers, concession awareness, and strategies for improvement. Several limitations should nevertheless be considered. The relatively small sample limits statistical precision and the ability to conduct complex multivariable analyses. The predominance of optometrists may limit generalizability to ophthalmologists and other professionals. Self-reported responses may also be affected by recall or social-desirability bias, and reported service provision should not be considered equivalent to objectively demonstrated competency. Furthermore, the cross-sectional design prevents causal inference. Finally, comparisons with previous studies should be interpreted cautiously because populations, questionnaires, definitions, and healthcare settings differed.

Future research

Future studies should use larger, multicentre, and professionally diverse samples with standardized knowledge instruments and objective competency assessment. Adequately powered studies should evaluate whether formal training, professional experience, practice setting, equipment availability, patient volume, and referral access independently predict knowledge and service provision. Interventional research should also evaluate structured continuing professional development using pre- and post-training knowledge, objective competency, referral behaviour, device prescription, and patient-reported functional outcomes. Further research should assess the effectiveness, affordability, usability, and acceptance of emerging electronic, AI-assisted, and wearable technologies in routine low vision rehabilitation (Okasheh-Otoom, 2026; Varshney, 2025; Varshney et al., 2025).

Overall interpretation

The present study indicates that the central challenge in low vision care is not simply lack of awareness, but incomplete translation of awareness into standardized assessment, appropriate intervention, and effective rehabilitation. The relatively

high general awareness observed among practitioners was accompanied by lower criterion-specific knowledge and less consistent application of standardized criteria, consistent with evidence from India, Saudi Arabia, Pakistan, Ghana, Malaysia, Korea, the United Kingdom, Australia, Jordan, and Switzerland (Akuffo et al., 2025; AlShehri et al., 2025; Alam et al., 2025; Arshad et al., 2024; Gould et al., 2024; Jin & Yi, 2016; Jose et al., 2016; Okasheh-Otoom, 2026; Seifert & Nosch, 2024; Wong et al., 2025). The persistence of training deficits, limited awareness, equipment and device constraints, cost, referral limitations, and patient-level barriers across diverse settings further indicates that low vision under-provision is a multilevel health-system problem (Bhattacharjee & Varshney, 2025; Bhattacharjee et al., 2026; Khan et al., 2005). A comprehensive response should therefore combine competency-based practitioner training, appropriate equipment, affordable assistive devices, patient and public education, financial-support awareness, structured referral pathways, and responsible integration of emerging assistive technologies. Such a strategy may help convert high awareness into consistent clinical practice and ultimately improve access to meaningful, patient-centred low vision rehabilitation.

Conclusion

This study identified a substantial gap between general awareness of low vision and the application of standardized knowledge and comprehensive rehabilitation practices among eye care practitioners. Although awareness was generally high, deficiencies in criterion-specific knowledge, training, device accessibility, referral pathways, and patient-level support may limit effective service provision. These findings support the need for competency-based continuing professional development, improved access to affordable rehabilitation resources, structured inter-professional referral pathways, and greater awareness of available financial and social support. Strengthening these components within routine eye care may help translate practitioner awareness into timely, accessible, and patient-centred low vision rehabilitation. Future multicentre studies should evaluate whether targeted educational and service-level interventions improve practitioner competency, actual service provision, and patient-centred functional outcomes.

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Statistical analysis: Dr. Ankit Sanjay Varshney, Dr. Helly Thakkar, Optom. Noopur Solanki

Manuscript drafting: Optom. Noopur Solanki, Dr. Helly Thakkar, Dr. Ankit Sanjay Varshney

Critical revision of manuscript: Dr. Helly Thakkar, Dr. Ankit Sanjay Varshney

Final approval of manuscript: All authors

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Conflict of interest

The author declared no conflict of interest.

Ethics approval

The study protocol was reviewed and approved by the Institutional Ethics Committee (Approval No. IEC/BMCOP/2024/015). The research was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

AI tool usage declaration

No AI tool was used in manuscript preparation.

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